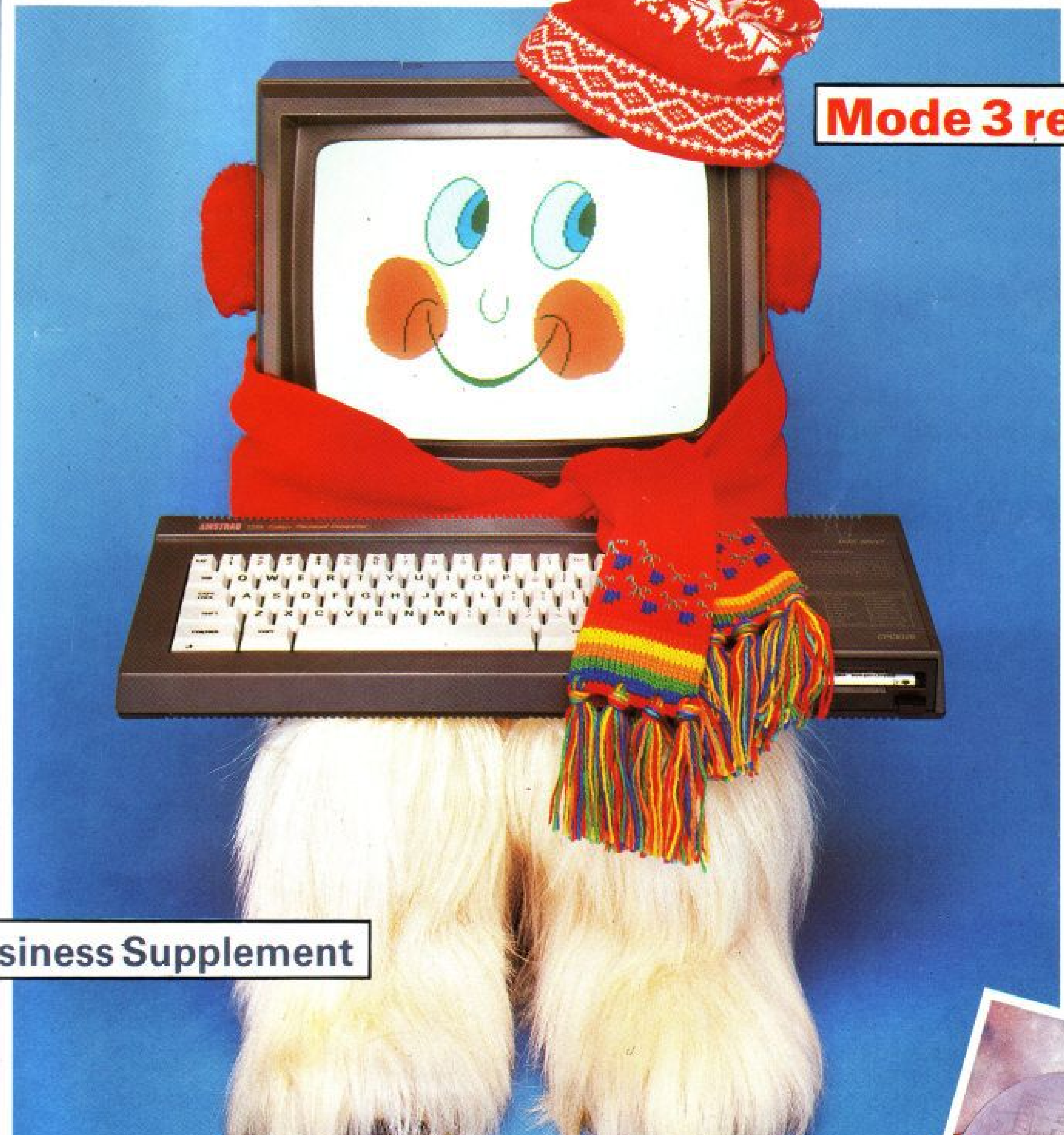
January 1986 95p

AMSTRAD COMPUTER USER



Mode 3 revealed

Free Business Supplement



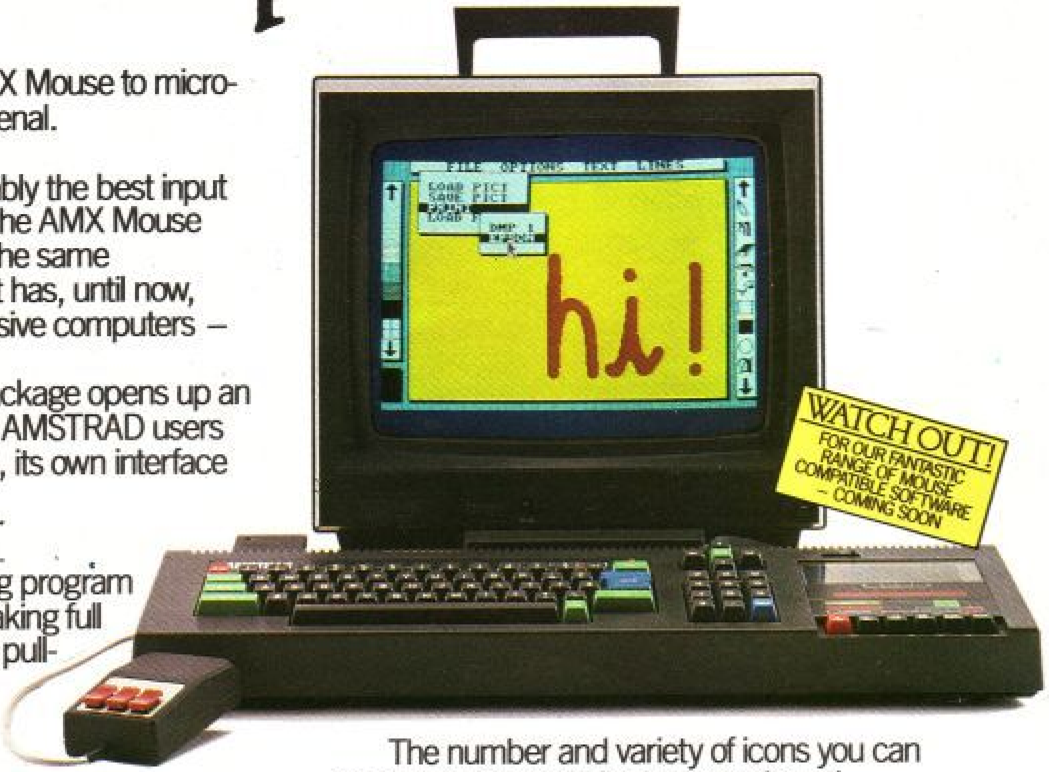
Game of the Month

The Amstrad User Awards - Your Chance to Vote

Plus News, Views, Listings and Competitions


An Andrew Spencer / Elite Joint Production
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BASKETBALL
GAME FEATURES
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• Realistic animation with jump, block and steal manoeuvres. You can even jump and turn in mid-air before slamming the ball into the basket.
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CBM64 SCREEN SHOT
FLYERS
8
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We thought it was about time we put you in the picture.



When we introduced our AMX Mouse to micro-users, the response was phenomenal.

And no wonder!

Hailed by the press as 'probably the best input device that has arrived recently', the AMX Mouse brings to AMSTRAD CPC users, the same sophisticated, positive control that has, until now, been the province of more expensive computers – like the Macintosh.

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This computer aided, drawing program has to be seen to be believed. Making full use of on-screen windows, icons, pull-down menus and pointers, you'll be simply astonished at the quality of work you can produce, store and print. There is even a pattern design program which gives you an unlimited number of designs for use in your own drawings.

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AMX CONTROL

Now you can create a 'Mouse' environment in your own programs, AMX Control adds extra commands to normal Basic and features two programs.

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The number and variety of icons you can create is limited only by your needs and imagination.

This fabulous AMX Mouse Package costs only £69.95, a price as remarkable as the package itself and it includes a fully illustrated operating manual.

The software is supplied on cassette, and 3" Disc. The AMX Mouse Package is compatible with Amstrad CPC 464, CPC 664 and CPC 6128.

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SOFT-5014 Issue 14 January 1986

AMSTRAD COMPUTER USER

Regulars

Features

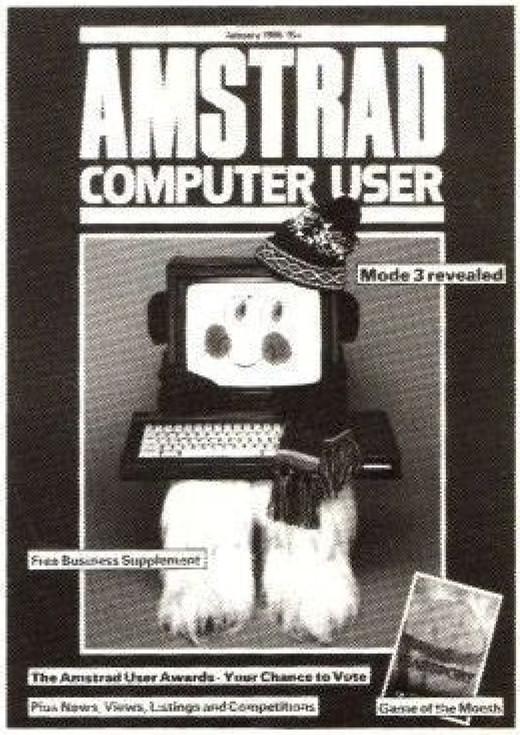
Competitions

Programs

Reviews

Amstrad Business Computing

Amstrad User is the OFFICIAL magazine for users of the Amstrad CPC 464/664 and CPC6128, PCW8256. It is published monthly, the next issue will be on sale from January 9th 1986. Back issues are available from Amsoft Mail Order at £1.20 each (including postage). Issues 1, and 2 are sold out. Overseas readers should contact Garwood Wholesale (0245) 465 007



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User News...

Good-Bye William



William Poel, General Manager of Amsoft and Managing Editor of Amstrad User has left Amstrad to run New Star. William was an early influence in the 'Arnold' project and has always been particularly interested in software support. New Star will specialise in finding the best available serious software for Amstrad computers and selling it at reasonable prices. The jewel in the New Star crown is NewWord, a Wordstar-like word processor at half the price.

"The most important feature of our selection", said William,"is the fact that all the software we intend to promote has a logical upgrade path through to 16-bit and multi-systems. My guess is that the Amstrad revolution will cause a much quicker re-evaluation of the multi-user, multi-processor approach that was extolled in the ABC section of the December issue, since the overall costs and benefits of Amstrad computers as terminals and self contained work-stations are going to wipe out stand-alone PCs for serious businesses much sooner than most people believe possible."

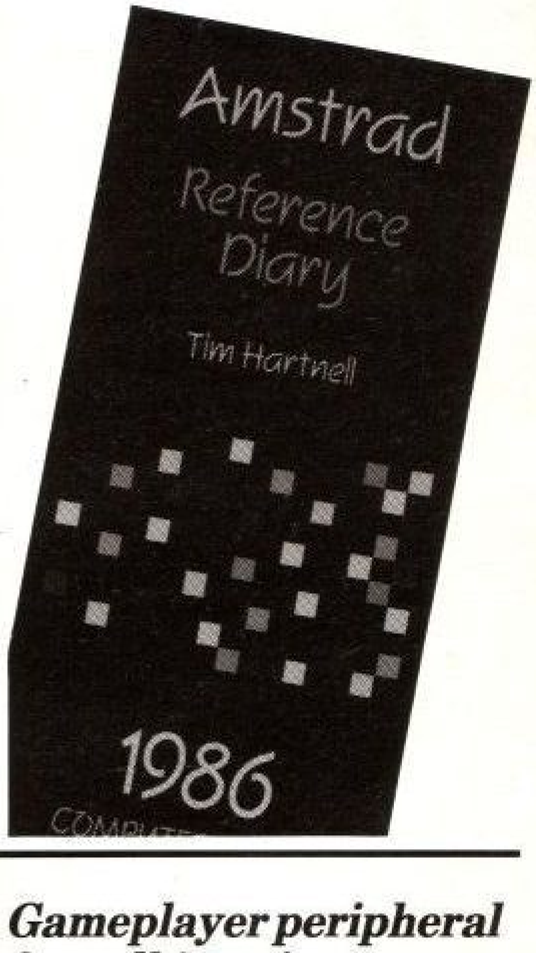
"Our customers will not thank us if they find that they have to re-learn the software as they expand their horizons, and with so much good software meeting this specification, we have no shortage of choice."

New Star has already got off to a roaring start, and William apologizes for the fact that the telephone line has been totally jammed during business hours, but tells us that there are now extra lines on (0277) 220573.

Readers will not be deprived of William's prose, he will carry on writing for the magazine and will find out what it is like waiting for someone else to process contributors payments.

Don't Leave Home Without it

The annual time for throwing away diaries is upon us. Therefore you'll want to buy another. One you might like to consider is the Amstrad Reference Diary published by Pitman Publishing. This is a long slim diary with 'soft' covers. Amongst the useful information it contains is our address, descriptions of the 464 and 664 in case you forget what they are like, some rather inaccurate general information, some Basic listings, and perhaps best of all, a list of the firmware entries to the jumpblock. Oh, the diary also has pages of dates with spaces for writing things. This is a real innovation as you don't have to keep looking them up on your wrist watch. The price is £3.95, but its cheaper than a firmware manual.



Unlucky for Some

Your intrepid Editor has been sent an invitation to a press launch. What's so special about that, we hear you ask. Well, this one he doesn't want to go to! It's the launch of Friday the 13th, the computer game and judging by the accompanying picture, a strong stomach will be needed. The game revolves around Jasons' revenge for the killing of his mother, after he was drowned. Now having risen from the dead he is determined to spoil your holiday. Killing an undead is pretty difficult at the best of times, Jason makes things more difficult by masquerading as a fellow camper. There is a selection of weapons and of victims, each time you kill him he rises from the dead, more aggressive and more intelligent.



Gameplayer peripheral from dk'tronics

Those electronic wizards at dk'tronics have a new peripheral in the pipeline. Called the 'Gameplayer' it will make any fast arcade game easier, it plugs into the expansion port and slows down the rate at which the computer runs. All the games then run much slower, giving you a chance to see the bullets before they hit you. No price has been set for the device but you can get more details from dk'tronics on (0493) 602926

New Software



The quality and quantity of software which has found its way into the Amstrad User office over the past few weeks has really improved. The serious user will appreciate three new CP/M titles from Caxton. They are Smart Key, Cardbox and Brainstorm.

Smart Key allows you to set up any key on the keyboard to produce any set of characters. One key can hold up to 30,000 characters but then there won't be much space for your applications program.

Brainstorm is called an ideas processor. It allows you to divide an idea into several sub-sections and each subsection into smaller sections and so on. The final database is a 'tree structure', all the branches of the idea leading to a central root. There will be a full review soon.

Cardbox is a powerful database, it scores in being easy to use and understand

All the Caxton software has been available on 5 $^{1}/_{4}$ inch CP/M discs for some while now, however the Amstrad versions cost very much less, around half the price of earlier versions. Cardbox is £99.95, Smart Key and Brainstorm are £49.95 each. For details contact Caxton on 01-397-6502.

Games fans will have a great Christmas. The biggest bargain is 'They Sold a Million' a compilation tape from Ocean, Ultimate, Software Projects and US Gold. Herberts' Dummy Run is the Mikro Gen follow up to Everyone's a Wally. You have to guide Herbert around a toy store. The game consists of several sub-games, and uses the excellent sprite routines which characterize the Wally games. Great music is a feature of Dynamite Dan, a new ladders and platforms game from Mirrorsoft. Look out for Spitfire 40, a combat flight simulator which will shortly be released by Mirrorsoft.

Bug Byte, one of the very first software houses, has been resurrected by Argus Press Software to sell budget games. Their first Amstrad title is Dogsbody, a 'Roland in the Caves'/'Fruity Frank' type hybrid. Cashing in on the huge success of 'The Way of the Exploding Fist' Melbourne House have released a sequel in the form of 'Fighting Warrior'. This takes you back to ancient Egypt where you do battle with a variety of humanoid beasts. The game has detailed graphics which extend into the border. A good game for the bloodthirsty..

Cauldron is a kind of female Sorcery. You take on the role of a witch, committed to destroying the evil Pumpkin. To do this you will need to collect a variety of objects. If you would rather flex your brain than your reflexes then perhap you should look at Quiz Quest from Alligata, bone up on your general knowledge and settle down with the family, to a post-Christmas dinner argument.

In an attempt to wrest the Mastertronic grip of the charts BT Firebird have launched a new range of budget software. Priced at £3.95 it is called 'Super Silver'. The first three Amstrad titles are Don't Panic, Willow Pattern and Chimera. First impressions are promising. The newest arrival at the ACU office is Obsidian. A very good fly -'round -a- maze - and -collect -the - objects game. Great mode 1 graphics and a lotta fun.

Saving the best until last, Strangeloop from Virgin looks every bit the what-the-gang-of-five-did-next program it is. Loads of rooms to explore, puzzles to solve and the famous GOF graphics, you even get to shoot things.

Watch out for new software from the mega-programmers at Ultimate. There will be a cowboy/western type game called 'Gunfright' and a space game called 'Cyber Run'. The software should hit the shops early December, so start saving your pennies.

Forty Column Joyce

One of the features which makes the Joyce (PCW 8256) wordprocessor outstandingly useful is the 90 column screen, so who in their right mind would want special software to work in 40 columns. Surprisingly the answer is 'lots of people', or at least that is the claim made by Chris Laing of Honeysoft who are producing the program. The new package will allow Joyce users to use British Telecoms' Prestel database. You will need a modem and the CPS 8256 serial/parallel interface. Because the PCW 8256 is a green screen only system it will not be possible to take advantage of the colour graphics offered by the system but Honeysoft will endevour to produce the best possible results.

Bright Sparks

We had a large number of entrants for the dk'tronics light pen competition. The lucky winners are;

Mrs Pauline Hinton of Reading. Carl Whalley of Manchester. Robert A Bewes of Lancaster. D Hardwick of Merseyside. Mr W B Gray of Aberdeen. Matthew McGough of Preston. Adrian Hall of Edgware, Middlesex. Mr D K Cook of Barrow in Furness, Cumbria. M P Collier of Sunderland. Robert Saksons of Storrington, West Sussex. Haran Sivagnanaratnam of New Malden, Surrey. Graeme Beton of Cressing, Essex. Sarah Taylor of Matlock, Derbyshire. Antony Critchley of Bracknell. Leon Zeldis of London N1. Adrian McCarthy of Sidcup, Kent. Arron Tang of Bartley Green, Birmingham. Charles Blythe of Tilehurst, Berkshire. D Pye of Stoke Gifford, Bristol. R M Edwards of Abingdon, Oxon. Mr F J Griffiths of Birkenhead, Merseyside. Mr N Evans of Stoke on Trent. C H Spragg of Sale, Cheshire. And finally C A Easton of Middlesbrough.

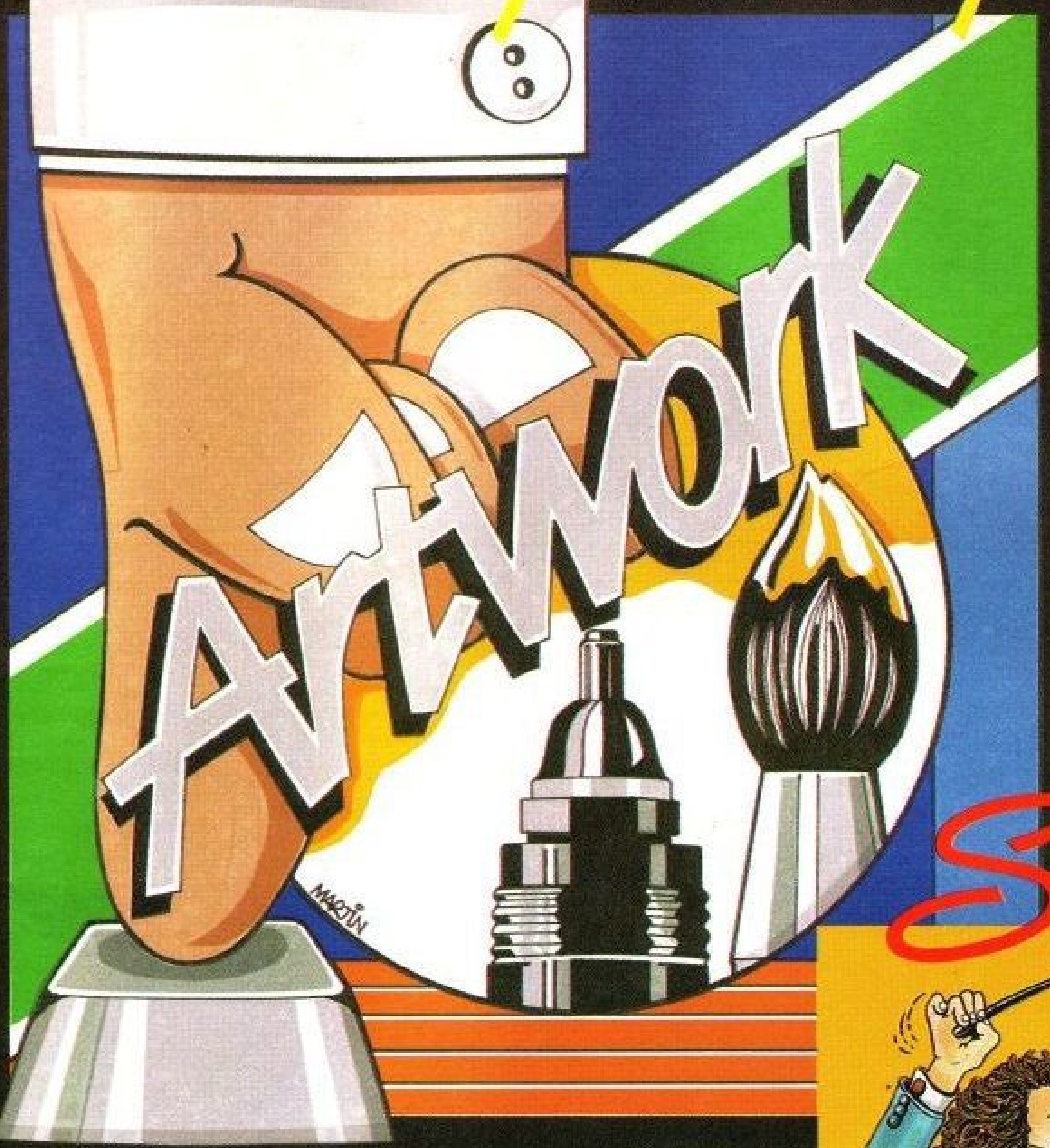
The answer was of course 10.

Right Herberts

The winners of the 50 copies of 'Herberts Dummy Run' are; K M Kosniowski, Steven Gratton, Julian Crockford, Craig Taylor, Mark Farley, Pascal Sendron, C McDougall, Stephen Abraham, D F Winter, B A Janes, Peter R Kalu, I Leach, Robert Eadie, Justin Leahy, D P Quincey, T Pigram, R A Smith, Keith Evans, Peter Lewis, Bhupendra Patel, Timothy Berry, Mark Royster, H Siva, J Cater, Gary Walters, Scott Maxfield, Peter Lavers, J M Lloyd, John Gilbertson, Andrew Peerless, John F Conybeare, Craig Torrie, David Earl, Paul Harrion, Michael Burdass, M R Forsdyke, P N Scottorn, D R Withey, Anon of Netherlands, David Cummings, Ashley Cotter-Cairns, Nigel Bell, David Gaughan, Carole Henderson, O Cunningham, Vikki Husband, D G Scott, Philip Reeves, Alan Wright, Stuart Rankin

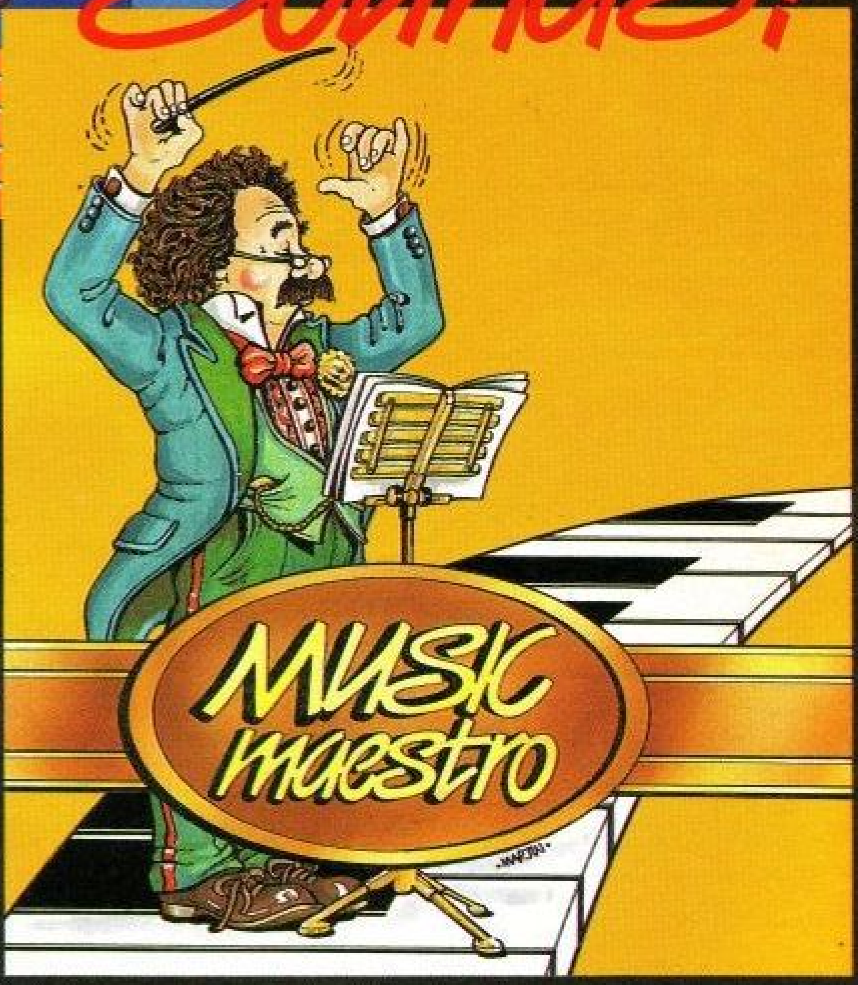
Everyones a Wally because; We left the name and address coupon off the competition form and you didn't realise and sent lots of anonymous entries!

Superb Graphics!



ARTWORK – A superb graphics program designed to allow even the most inexperienced user to create graphic displays. Draw pictures using sophisticated circle, ellipse and box drawing facilities with full use of all available screen modes and colours. Special features include Fast Colour Fill, complete Screen Scroll (all directions), 'Help' option and the ability to save or load completed pictures to tape or disc. Whether you have a serious interest in art or simply enjoy doodling, this easy-to-use program is guaranteed to provide hours of enjoyment.

Great Sounds!



MUSIC MAESTRO If you're musically inclined and want to write music this programme's for you! It offers a wide selection of sounds and a choice of rhythms. The music composed can be saved to tape and edited. Impressive screen presentation and ease of use make this a highly desirable package.

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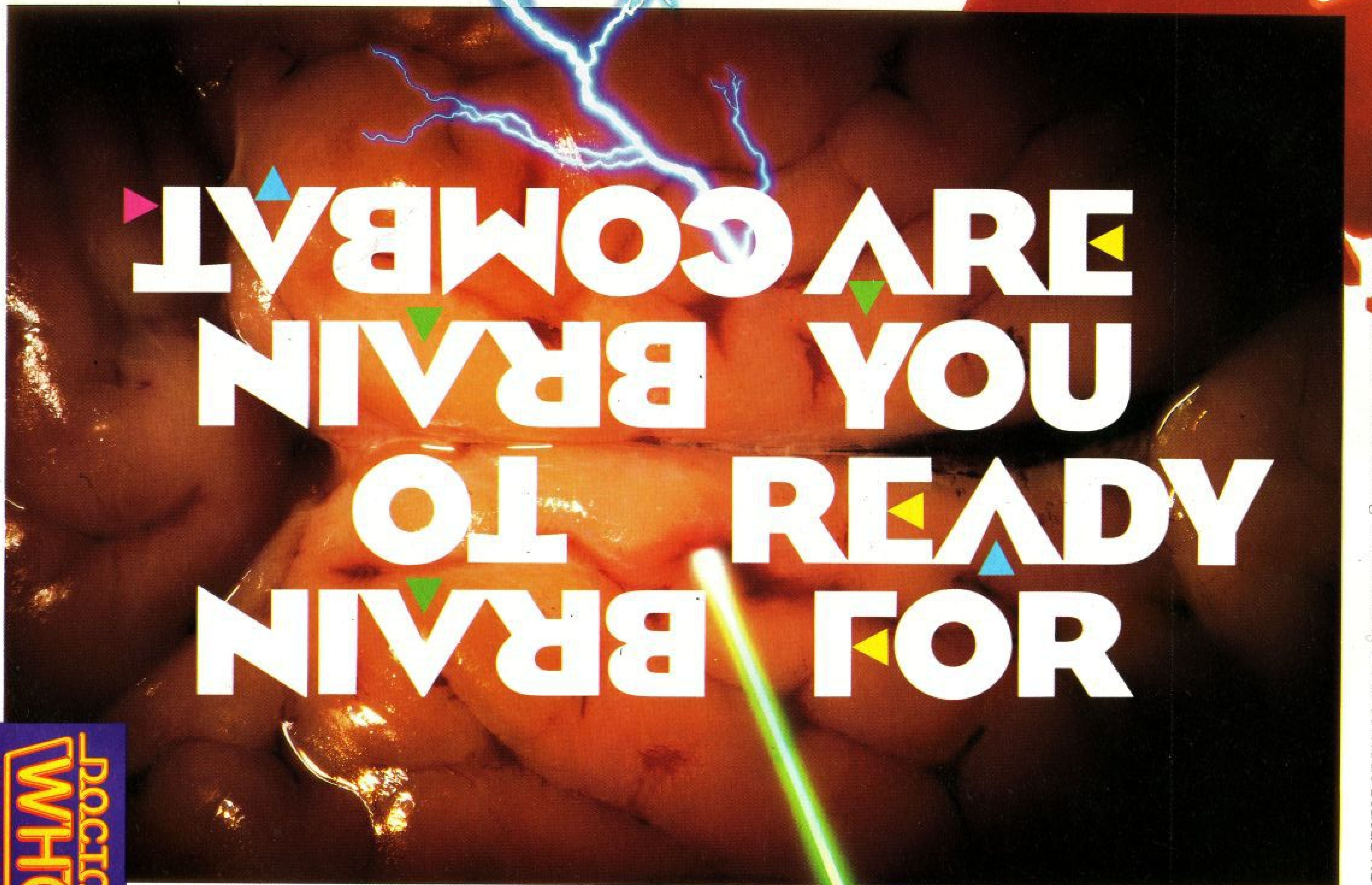
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Machine skill VITAL. Doctor: ultimate risk scenario. Your int[…]vention urgently requested. ??? HELP? ??? Disable TIRI […] ▸ Regain
FORM



Zi (Ur$_4$ ($\Lambda^{13}C_5H_5N)_8$ O$_4$ Fl$_8$) OH$_4$ · 16H$_2$O } ◆ ● — ○ — 2nd Moon Rijar. — ○ ○ ○ ● ○ ○ ○
Use invisible cat + code: string ◇ etc. Full cerébral combat status needed all times. ≷ Halt Heatonite prod. ▶ Access via VDU.
● Blue print (part) supplied. Ky-Al-Nargath construct[…]n. ≋ MEGA SECURE !!! Pr[…]gramme *concealed* in game Pack ☐ *Who would think of a Police box?*
Madrag [genetically boosted saurian] + psycho

▶ Time Instant Replay Unit ✚ brain ⊐ (Who's?)
– robotics + techno trickery ≡ Force futile. ▶ *Weapon Skills NA* ◀

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Frank Bruno Competition



The position of the referees head was just above the lefthand boxers left elbow.

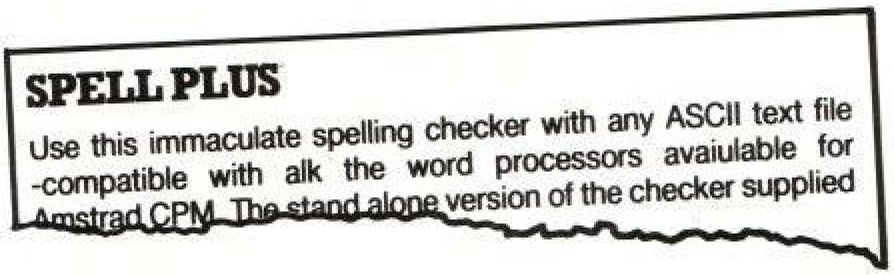
Winner of Frank's autographed gloves is S P Elford, of St. Leonards on Sea, East Sussex.

99 other winners will be recieving their copy of Frank Bruno's Boxing. They are; Peter Lewis, Micheal Berry, Matthew Caton, Carl Poland, Mark Thompson, Paul Hoare, Barry Whittaker, Peter Broomhead, Malcolm Fortune, J Barrow, Dean Adam, Stuart Cooke, Thomas Ward, Graham Phelps, Gareth Jones, Mary Sloan, Warren McCallum, John Grierson, C Brown, Ben Scales, Gary French, J Milne, Andrew Russell, James Watson, Barry Langstone, Peter White, Michael Shedden, P H Doherty, Robert Jackson, Cassandra Farncombe, P J Eva, Jonathan Biles, Andrew Ross, Peter Browne, Viggo Eriksen, Steven Marsh, Ashley Cotter-Cairns, Knut Jarle Bjoernestad, Paul Hardy, Pierre Scottorn, Richard Sandford, Sufyan Dadabhai, K Bugler, M P Collier, D Whitfield, Lee Maxwell, David Long, Geraint Waters, Donald Macdonald, Gary Vandesande, Simon Ward, C Henderson, Tim Chick, Jason Saville, John Howard, M Thompson, D R Brown, Paul Kozak, D S Spadafora, Stuart Hopkins, John Kelly, Andrew Straughton, James Shattock, Rhys Jones, E Doucie, D Rhodes, Peter Kirkwood, Matthew Selley, Jonathan Craig, D V Piears, Andrew Oxley, P Hillard, S Lane, Jozef Lightbody, Nic Drew, Diane Cherry, Ian Tyson, Damion Peacock, S Bracewell, Barry Vint, Adrian McCarthy, Jim Read, Richard Ford, Robert A Johnson, Joseph Caine, D N Laine, John Walton, Winston Fullerton, David Corrall, David Cummings, Steven Dixon, O Cunningham, D G Scott, Richard Hartshorn, Grant Hepburn, B Whitten, W T Murphy, Stephen Creegan.

ACU

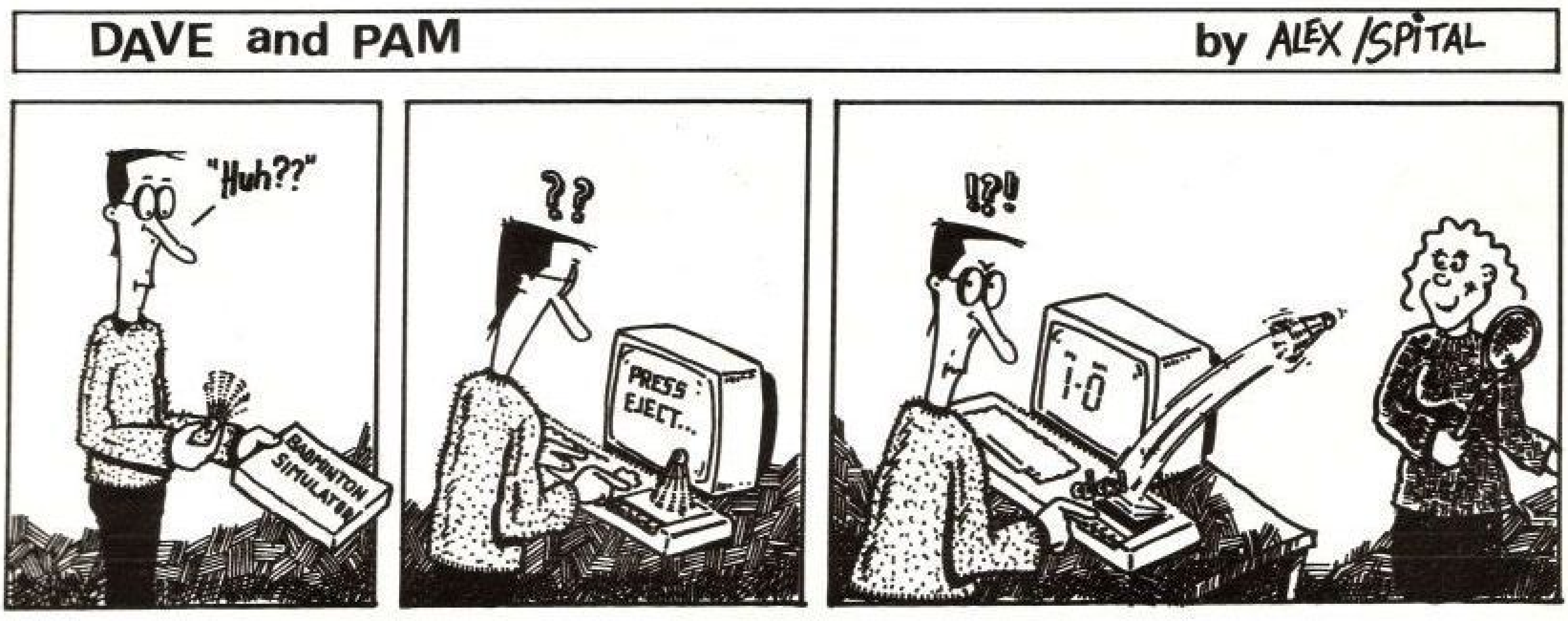
Practice What You Preach

Leafing through the New Star catalogue makes interesting reading. It can also be ironically funny. Look at this entry for Spell Plus.



SPELL PLUS

Use this immaculate spelling checker with any ASCII text file -compatible with alk the word processors avaiulable for Amstrad CPM. The stand alone version of the checker supplied



Jingle CHR$(7)

Christmas causes a seasonal hump in the sales graph of every computer manufacturer. Every Christmas brings a host of new computer owners. This year there will be more people learning how to make the most of their new Amstrad computers. An article to help these people would be boring for the readers who have been using Locomotive Basic for a while. There is a middle road, starting next month we will have a series on the neglected commands and features in Locomotive Basic. A quick test for those of you who think you are experienced in programming. What is the result of PRINT(INSTR("abc","") and why?

Are you one of those people who goes into computer shops and starts hammering away on the keyboard. In most shops this is really boring. Walk into the local WH Smiths or Dixons and you are quite likely to see "Arsenal Rule" scrolling constantly up the screen. Sometimes the footloose programmer will be more creative and type in something of interest. See if you can beat this for an interesting shorty. It is a one line game. You have to type the word "stop" before the car hits the wall.

```
10 SYMBOL 255,0,0,0,60,114,255,102,0:CLS
   :PRINT TAB(30)"I":LOCATE 1,1:WHILE PO
   S(#0)<29:PRINT" ";CHR$(255);CHR$(8);:
   WEND:FOR n=1 TO 4:a$=a$+INKEY$:NEXT:I
   F a$="stop"THEN PRINT:PRINT"WELL DONE
   !"ELSE PRINT"**":PRINT"RUBBISH!":SOUN
   D 1,99
```

I cheat and define a key as the word 'stop', but that ruins the game. Your program can be longer than one line but it should be short enough for you to type in before the shop assistant throws you out. We will find a prize for the best shorty, don't bother sending in tapes. If the program is long enough to be worth saving it is too long for the competition.

There is something missing from this magazine. 'Roland Takes a Running Jump' has jumped right over this issue. But have no fear, Roland will return...next month.

A quick word of thanks to Ski and Sea in Brentwood for the loan of the woolly hat and boots used on the front cover, no one wants to take them back because they know that they will end up spending a fortune in the shop.

What goes one, two, three, two? Amstrad User, that's what. In November you got one magazine. In December you got two -- Amstrad User and Amstrad Business Computing. This month you get three magazines, or, to be more accurate two magazines and a software catalogue. You can pull the catalogue out and read it seperately. Next month we should be back to only two magazines, but who offers that for only 95p?

Simon Rockman

Please bear in mind that the views expressed herein are not necessarily those of Amstrad or Amsoft. Be assured that all your views are given thorough consideration. This letters section is the Amstrad Computer User's own forum.

Write to reply



Speedy Splatch

I am not a great games enthusiast but I really must congratulate Mark Roberts on his excellent game of Splatch in issues 12 and 13. This is above the standard of much commercial software. It is a great pity that it takes the seven Basic programs so long (6 minutes from disc), to poke the machine code before it comes to life.

It is very easy to convert the program to load directly after having ensured that all parts work.

Firstly this short loader program should be saved at the beginning of a new tape as "SPLATCH".

```
10 MEMORY 20759
20 LOAD "!SPLATCH.BIN"
30 CALL &BD19:CALL 21760
```

It is a good idea to print a description on the screen after line 10 since even with disc loading there is still a ten second delay while the code is loaded.

Do not rewind the tape but remove it from the recorder. Load (not run) program 7 and add :STOP to line 110 and save the new program 7.
RUN "program1" which will run each of the others in turn and all the code will be poked into memory and the program will stop.
It is then only necessary to reinsert the loader tape then enter SPEED WRITE 1:SAVE"SPLATCH.BIN",B,20760,18024.
The result is a fast loading version of a great game.

D G Shedden
Sudbury, Suffolk

Simple Cat

I like J.A. Campbell's Printed Disc Catalogue without CP/M (Oct. issue) which prints a disc directory in AMSDOS form, i.e. with space occupied by files, which DIR does not. However he may be overlooking a useful function of STAT, the CP/M utility.

I invite your readers to try ↑ P[ENTER] followed by STAT *.*[ENTER] to print an alphabetical list of all files on a disc together with occupation space and R/O or R/W status. It also gives the remaining disc space. But don't forget to turn the printer off with another entry of ↑ P before proceeding.

The *'s can of course be substituted by filename and/or type (eg. LETTER.TXT) as suits the user's purpose.

John Matheson
Edinburgh

Attack of the Yorkie-eaters

My friend and I, both trans-European H.G.V. drivers, were appalled to read the many (2, actually) derogatory references to lorry-drivers made in the November issue of your scurrilous organ, so much so that we decided to conduct a survey amongst our colleagues. The results show that in fact 66.66% of those asked bought rom-based disc-utilities as their first add-on. So much for Page 72, col.2, line 38.

It is also a well-known fact that 42% of lorry-drivers use K.D.S. 104 modems and we humbly submit that, being used to studying documents in depth, e.g. the Highway Code, we may be able to suggest an easier way of getting into 80 column mode than that suggested by your reviewer on Page 36, col.2, paragraph 2, and it can actually be done whilst on-line. Ready?

STEP 1). (And this is the difficult bit!) Read the Manual

STEP 2). Press ‹CTRL› and numeric key-pad 'dot' (.) as stated in the manual (Pages 4+6).

If your reviewer is still confused, we have a 10 page brochure explaining this in greater detail.

We were going to suggest that some of your contributors might consider changing jobs with us, but then realised of course, that in order to drive an H.G.V., you must first read the manual.

In closing, please reassure us that it was an intentional joke spelling 'superceded' as 'SUPERSEDED' in an article on 'Artificial Intelligence'?

Ben Articulato. (Italia), Laurie Driver. (England).(SOCIETE INTERNATIONALE DES ROUTIERS AVEC DES CPC 664s ET DES MODEMS KDS 104 ET TOUT CELA.)

Dialling Code

I frequently use BT Gold and various on-line databases at work, for which I use a rather more sophisticated (and fourty times more costly!) micro, which has the essential facility of being able to record the information obtained whilst on-line in a word processing file, thus enabling off-line editing and printing of the information obtained.

Now I am able to access these services from home, but a long report is of little use unless it can be saved and printed - my memory isn't that good!

Do you know of any way in which information retrieved from, say, a database, could be simultaneously recorded onto disc, perhaps to be loaded into Amsword or similar for the editing and printing process? This would vastly enhance the capability of my home system.

A.M. Mumford
Kent

ACU: Honeysoft have a suitable terminal program. We intend to review it next month, you can contact them on (0277) 217306.

Seeing through X-rays

In Write to reply, November 85 issue of The Amstrad User, your reply to Mr Haveill of Bouremouth was misleading. While I agree that is is unlikely that X-rays could cause damage to the integrated circuits in his computer it is something that should not be ruled out as there is a possibility of some high powered units causing damage. As for

damage to disc etc from magnetic fields this is unlikely from X-Ray units; as an X-Ray engineer I know of no unit that uses magnetic fields to produce X-Rays.

C.R. Jayne, Leeds

6128 into 464 won't go

Also a query, is there a listing to turn the '6128 into a 464', as many friends of mine have '128's' and are fed up of in-compatible software?

Ashley Cotter-Caivns
Surrey

ACU: We published a listing to overcome 'memory full' problems in the July issue of ACU, however some programs will not work on machines with the 1.1 ROM whatever you do with trick software.

Sine of the Times

When working on equations such as $y^2 + y + 1 = 0$, I tried to use y ↑ 2 + y ↑ 1 + y ↑ 0 = 0, which is a valid expression. When y is negative, and 2,1,0 is set by a FOR NEXT loop, y ↑ 1 returned the correct answer but of the wrong sign. This only happens when y and the exponent are stored as variables.

EG. ?-2 ↑ 1 correctly returns -2
but y=2:x=1:?y ↑ x incorrectly returns +2

Other values of x return the correct answers. Trying

```
10 y=-2
20 FOR n=-3 TO 3
30 ?y↑n
40 NEXT
returns
-0.125
0.25
-0.5
1y↑0=1wrong
2
4
-8
```

Note how the sign sequence misses one negative.

Colin Burn, Norwich

Tasword fix

To people like me who are using Tasword (or Amsword) as a disc system and would like a catalogue command here is some help:

Run Tasword as usual and use the 'into Basic' command. Now insert line 295 and 395;

```
295 IF a=9 THEN MODE 2:PEN 1:|DIR:WHILE
INKEY$<>"":WEND:WHILE
INKEY$="":WEND:GOTO 230
395 a$(9)="disc dir":b$(9)="D":b(9)=61
```

edit line 300,400,470 and 500 into this:

```
300 CLS:PEN 1:LOCATE 10,1:PRINT "TASWORD the word
processor":LOCATE 7,2:PRINT CHR$(164);"
Tasman Software Ltd.
1984":RETURN
400 FOR j=1 TO 9:LOCATE 9,j*2+2:PRINT a$(j):LOCATE 31,
j*2+2:PRINT
b$(j):NEXT j
470 a=0:FOR j=1 to 9:IF INKEY(b(j))<>-1 THEN a=j
500 PEN 3:LOCATE 9,a*2+2:PRINT a$(a):LOCATE 31,
a*2+2:PRINT
b$(a):PEN 1
```

Now RUN the program. The menu should now have the 'disc dir' command. Type 'D' to test the command. If it does not work, your version of Tasword may have different line numbers and you will have to load Tasword again and figure out the new numbers.

These alterations have been tested on Tasword v1.02 and a CPC6128 but I hope it will work on the other versions of Tasword and Amsword.

Thomas Christensen,
Koge, Denmark

REM's

This is a new subsection of Write to Reply. The idea will be to put into print the most interesting, pointed, abusive, or funny comments that that we recieve in our postbag. We don't have the space to print these letters in full so we will just put the name of the writer after the comment.

On Sorcery Plus;

Seemingly at random, when I enter a highscore name, it sometimes erases my name and gives ARTISTIC.GOF.

How do I get into practice mode as offered when all 8 sorcerers are rescued?

How do I go forward from 'by the bridge'? (From Ian Townsend)

Two weeks ago, we bought a copy of the Virgin game, Sorcery+. Already, (yes,only two weeks from then), I can rescue all eight sorcerers with less than one half of the book time limit gone, move on to the second section and defeat the Necromancer, with less than one third of the book gone. Am I the first to complete the quest? (Alex Harvey)

There are a number of titles that get put into the high score table instead of the text entered. Try putting in an empty string. Fire and C pressed together and held down will get you into cheat mode. Go forward by using the club, we think. ACU

On Micro-draft

(November Software Competition winner)

Of what little I could see of the programs intended purpose I must congratulate Mr Hargreaves on his effort and strongly recommend that it is issued in the near future. (B G Ewart)

This months issue (Nov 85) was of particular interest to me as I read of 'Micro Draft'. I am currently studying Computer Science and have been looking for a program of Micro Draft's specification for some time. (Gerard Byrne)

Micro-draft is likely to become an Amsoft title in the future. ACU

On ABC

At first glance your new 'Business Computing' section, would appear to be aiming at owners of the PCW. This I would suggest is a mistake if you assume that most owners of the 6128 are still 'Arcade Freaks', most if not all are not! (P Tompson)

No, the Business Section is for both computers but it will probably concentrate on CP/M software. ACU

On Daley Thompsons Decathlon

(AKA DT,s Joystick Destroyer)

My son did not play this game for long as the excessive use needed on the joystick to acheive any progress resulted in the joystick breaking.

The game seems useless, much to my sons dismay, unless we purchase another joystick which may well break therefore proving rather costly. I would greatly value your opinion and any advice you can give. (Mrs M C Hutchings)

Perhaps a 'baseless' type of joystick would be better as the contacts are made by mercury switches. ACU

On Copyright

I have written a program which I would like to enter in your software competition, but I don't know how to get a copyright. (Mr G Wilson)

Copyright is easy, providing the work is original. At some point in the program display 'copyright of' then your name, the date, and a location or company name. No registration is necessary.

Amgraph Patch

With reference to the 'AMGRAPH' feature, by John Palmer, in the November issue.

A great graphs package but a pity the print command doesn't work on all Epson compatible printers, my Mannesmann Tally 80+ for example.

If any of your readers find the program fails to print (Printer not on line) then the following amendment to the Data in line 4140 may rectify the problem for:-

The third line of line 4140 should be amended to read:

```
1C900001B3312001B4B40010D0A00000303
```

and the checksum should also be altered to read: 8277.

Thanks must go to a colleague, Steve Thomas, at Pride Utilities for this information.

B Barton,
Hertfordshire

Specialist Requirement

For some years now I have been attempting to establish a home micro system which will allow me to edit a screen display with text and/or graphics then subsequently dump to a colour printer for hard copy all for less than £1000.

In September this year I bought a copy ACU and 'BINGO', there was a plug in and run colour computer driving a plug in and run colour printer all for less than £700. Immediately I enquired of you regarding club membership and the use of CPC 6128 with OKIMATE 20 and AMX mouse. I also requested information from AMX regarding the same set-up and Amstrad for details of the 6128. Within a month I had received a sales leaflet from Amstrad but no response from ACU or AMX. Within the following 2 months I had actually achieved the purchase of a CPC 6128, OKIMATE 20 and club membership, still with no confirmation regarding the use of 6128, OKIMATE and AMX together.

In your December issue your review of Arnors Protext word processor is so impressive in AD2 ROM form and would seem to solve at least my text editing/dump requirements, would you agree?

T Davies
Wolverhampton

ACU: The magazine cannot enter into personal correspondence, producing the pages is time consuming enough. What you really need is a good local dealer who knows the products and gets paid to offer you a service. The Protext ROM is a wordprocessor, it will print text, not dump a screen. You can save the Okimate screen dump by typing RUN 1000 when you have loaded the program.

ACU


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KOKOTONI WILF



Kokotoni Wilf is an arcade adventure whose undisguised intention is to steal the title of 'best arcade adventure program bar none' from Jet Set Willy.

As Kokotoni Wilf you must recover all the pieces of the legendary Dragon Amulet (which has been scattered throughout time) for your master the great magician, Ulrich.

Throughout the quest Wilf comes up against many dangers from huge lumbering prehistoric dinosaurs, to hostile alien robots, but the reward for recovering all the pieces warrants the risk.

Spectrum 48k	£5.95 (Cass.)
Commodore 64	£6.95 (Cass.)
Commodore 64	£8.95 (Disc)
Now Available for Amstrad	
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	£13.95 (Disc)

The 48K program features a number of major advances over Jet Set Willy. The games designer, Elite, stresses that each of the games 60 plus screen settings is genuinely high resolution, as opposed to psuedo hi-res, and doesn't require a title to explain what you're looking at. Furthermore, the sprite characters are of cartoon quality and exhibit their own personalities. Impressive claims. Jet Set Willy fans will no doubt feel both sceptical and intrigued ......

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Down in the Dumps

David Radisic **presents a shaded printer dump for Epson compatible printers.**

You may be thinking, "Oh No! not another printer dump program, I must have at least half-a-dozen already", but this is not just any old printer dump, it will take a screen, such as one from screen designer or your favorite games startup screen, and make an exact copy on the printer using a stippling effect, similar to the method used in newspapers, to create a shaded picture.

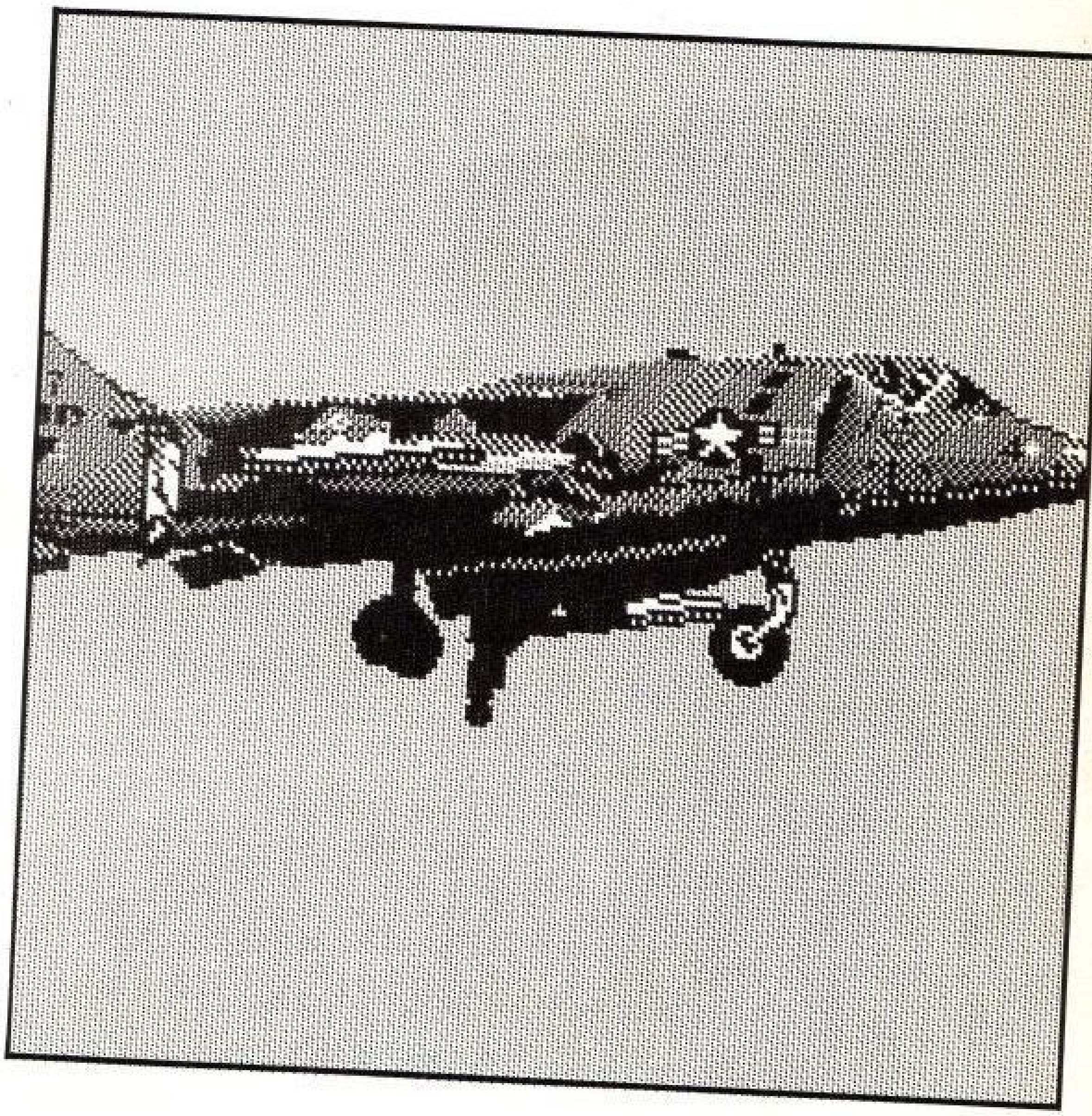
Listing 1 is Basic which, once typed in, should create a binary file called DUMP.BIN, this can then be loaded using the following example program:

```
10 MEMORY &7FFF:LOAD"DUMP.BIN",&8000:CALL &8000
20 ... rest of program ...
```

To dump a picture from screen designer then add the following:

```
20 MEMORY &6fff:LOAD"filename.SDS",
&7000:CALL &7000:MEMORY &7fff
30 |HUES
40 |DUMP
```

The |HUES command in line 40 can be replaced with manual settings.



Program listing 2 will allow you to load in any screen designer picture and dump it using an automatic HUES setting. When RUN it will prompt for an SDS file, that is a screen designer picture, after entering the name a check is made to make sure it is a valid filename, once this has been done the DUMP.BIN file is asked for, the relevant disc containing this file should be placed in the disc drive or cassette deck and any key pressed.

Once DUMP.BIN has been loaded the SDS file is asked for and again this disc should be placed in the drive and any key pressed, once completed loading the dump will start.

Hue goes there?

To use stipples you will need a grid. This program uses a 4 by 3 grid, each pen (or colour) on the screen is given a different grid pattern, in a 4 x 3 grid it is possible to get more than 20 different shades, so even in mode zero which has 16 colours there are more than enough patterns.

Setting up stipple patterns can be done using the |STIPPLE command, typing this on its own will select the default stippling patterns, but having 5 parameters following it, ie |STIPPLE,st,b1,b2,b3,b4, will change stipple st to the bit significant pattern of b1,b2,b3, and b4. eg.

```
|STIPPLE,2,&X111,&X101,&X101,&X111
          *    *    *    *
          *              *
          *    *    *    *

will produce a pattern of :     ****
                                *  *
                                ****     for stipple number 2.
```

There are in total 16 stipples (0 to 15) which can be changed with this command.

As well as the |STIPPLE RSX there are another 3 which are:

```
|DUMP
```

Dumps the entire screen to the printer, expanding each pixel to a 4x3 hue pattern. A complete dump should take about 15 mins. After each line is dumped the program checks to see if the SHIFT key is being held down, if it is the dump will terminate, returning the program to the Ready prompt.

```
|HUES [,h1,h2...h4][,h5...h16]
```

Without parameters this will automatically select hue settings from the inks used on screen, or you can select your own 4 or 16 depending on the screen mode. Default hues are 0 to 15

```
|LINE,x[,y,ycount]
```

Can be used to dump just one vertical line at x. If Y & YCOUNT are not specified then Y=0 and YCOUNT=200, that is starting from the bottom of the screen and going to the top (200 pixels will be dumped).

The HUES command can be likened to the PEN command under Locomotive Basic and the STIPPLE similar to the INK command. That is HUES will select the type of shade and STIPPLE can change that shade. The automatic hue settings will take the screen ink number (0 to 26) of each pen, in turn, and divide it by two (0 to 13) and then add two, which should end up with a number between 2 and 15 (15 is the brightest and 0 the darkest), so the end result will not be as effective as setting them up manually.

If inks 0, 12, 13, and 24 are used in the picture then the automatic hues will be set to 2, 8, 8, and 14.

The LINE command can be used to dump any section of the screen and can be used to dump letter heads, logos, sprites, icons, eg.

```
FOR x=280 TO 360 STEP 2:|LINE,x,180,40:NEXT
```

will dump a 40 by 40 area at the centre of the screen.

If a screen dump of a mode 2 picture is needed then the March '85 issue of ACU should be of interest, an article by Cliff Lawson called Events & Screen dumps will do perfect copies of mode 2 screens.

Listing 2 --

Basic Program to be used with DUMP.BIN

DUMP-BAS.

```
10 OPENOUT"dummy":MEMORY HIMEM-1:CLOSEOU
   T
20 MODE 1:INK 0,0:BORDER 0:INK 1,26
30 LOCATE 1,20:INPUT "Enter SDS filename
    :",f$
40 IF f$="" THEN 20
50 n=INSTR(f$,".")
60 IF n=0 THEN 90
70 IF n=1 THEN 20
80 f$=LEFT$(f$,n-1)
90 f$=f$+".SDS":IF LEN(f$)>12 THEN 20
100 MODE 1:INK 1,26,13:INK 2,13,26
110 a$="Place DUMP.BIN in drive":GOSUB 2
    00
120 MEMORY &7FFF:LOAD"dump.bin",&8000:CA
    LL &8000
130 a$="Place SDS file in drive":GOSUB 2
    00
140 MEMORY &6FFF:LOAD f$,&7000:CALL &700
    0
150 |HUES
160 |DUMP
170 INK 1,26:PEN 1
180 PRINT"Dump finished"
190 END
200 l=20-LEN(a$)\2
210 PEN 1:LOCATE l,15:PRINT a$;
220 PEN 2:LOCATE 11,20:PRINT"Then press
    any key";
230 IF INKEY$="" THEN 230
240 LOCATE 1,20:PRINT CHR$(20);
250 RETURN
```

Listing 1 --

Basic program to generate DUMP.BIN

DUMP2.BAS

```
10 MODE 1
20 MEMORY &7FFF
30 RESTORE 5000:ln=5000
40 loc=&8000:tst$="0123456789ABCDEF"
50 er$(1)="DATA ERROR ":er$(2)="CHECKSUM
    ERROR "
60 PRINT"At DATA line : ";
70 tl=0:READ h$,chk
80  FOR i=1 TO LEN(h$) STEP 2
90    v1$=MID$(h$,i,1)
100   v2$=MID$(h$,i+1,1)
110   IF INSTR(tst$,v1$)=0 THEN er=1:GOT
    O 250
120   IF INSTR(tst$,v2$)=0 THEN er=1:GOT
    O 250
130   n=VAL("&"+v1$+v2$)
140   POKE loc,n
150   tl=tl+n:loc=loc+1
160 NEXT
170 IF tl<>chk THEN er=2:GOTO 250
180 ln=ln+10
190 PRINT USING"####";ln:LOCATE 16,1
200 IF chk<>0 THEN 70
210 CLS
220 PRINT"No errors....Saving machine co
    de file : DUMP.BIN"
230 SAVE"dump.bin",b,&8000,loc-&8000
240 END
250 CLS
260 PRINT er$(er)"in line ";ln
270 END
5000 DATA CD0E81210C800110,538
5010 DATA 80C3D1BC00000000,720
5020 DATA 1F80C3D380C33380,1067
5030 DATA C39180C307810044,867
5040 DATA 554DD04C494EC548,866
5050 DATA 5545D35354495050,765
5060 DATA 4CC50021C800223C,600
5070 DATA 82210000224082FE,645
5080 DATA 012830FE03C0DD66,872
5090 DATA 01DD6E00223C8229,597
5100 DATA 297DFE803814E67F,981
5110 DATA 6F24222F822A3C82,590
5120 DATA 11200019223C822A,340
5130 DATA 2F82222F82DD6603,714
5140 DATA DD6E02224082DD23,817
5150 DATA DD23DD23DD23DD66,1091
5160 DATA 01DD6E00223E8221,591
5170 DATA 3182CD6B81CD4A81,1028
5180 DATA C9FE002823FE0428,828
5190 DATA 05FE102808C9211D,586
5200 DATA 8206041805212982,373
5210 DATA 0610DD7E00E60F77,733
5220 DATA 2BDD23DD2310F3C9,1015
5230 DATA 211A823E000610C5,470
5240 DATA F5E5CD35BC78E1CB,1468
5250 DATA 3F3C3C77F1C13C23,831
5260 DATA 10EDC9CDBC81212A,1051
5270 DATA 82CD6B81213182CD,988
5280 DATA 6B81014001C5CD4A,778
5290 DATA 813E15CD1EBB2015,687
5300 DATA 2A3E822323223E82,530
5310 DATA C10B78B120E7212A,839
5320 DATA 82CD6B81C9C1C9FE,1420
5330 DATA 05280DFE00C00640,574
5340 DATA 21DA81114382182B,661
5350 DATA DD7E00FE10D03237,930
5360 DATA 82DD23DD23060421,685
5370 DATA 3B82DD7E00E60777,892
5380 DATA 2BDD23DD2310F33A,872
5390 DATA 3782CDB281113882,900
5400 DATA EB06047E12231310,459
5410 DATA FAC9212C82CD6B81,1099
5420 DATA ED4B3C82C5CD8781,1168
5430 DATA C10B78B120F62134,864
5440 DATA 82CD6B8121000022,638
5450 DATA 4082C93E1BCD7B81,941
5460 DATA 7E23477ECD7B8123,850
5470 DATA 10F9C93242823A42,836
5480 DATA 82CD2BBD30F8C9ED,1301
5490 DATA 5B3E822A4082CDF0,964
5500 DATA BBCD9D812A408223,949
5510 DATA 23224082C926006F,613
5520 DATA 111A82197ECDB281,836
5530 DATA 06047ECD7B812310,644
5540 DATA F9C926006F292911,698
5550 DATA 438219C921000011,473
5560 DATA 0000ED533E822240,610
5570 DATA 82CDC9BB21200311,808
5580 DATA C800222F82ED533C,791
5590 DATA 82C9070707070502,366
5600 DATA 0502030603050502,31
5610 DATA 0306030205060603,34
5620 DATA 0505050707050205,41
5630 DATA 0202040502010401,21
5640 DATA 0401040104000401,19
5650 DATA 0104000401000200,12
5660 DATA 0002000200000000,4
5670 DATA 0000000102030405,15
5680 DATA 060708090A0B0C0D,76
5690 DATA 0E0F0140042A0220,174
5700 DATA 03023307020D0A00,88
5710 DATA 00000000C0000000,200
5720 DATA 0000000000000000,0
```

ACU

SOFTWARE

GALLUP



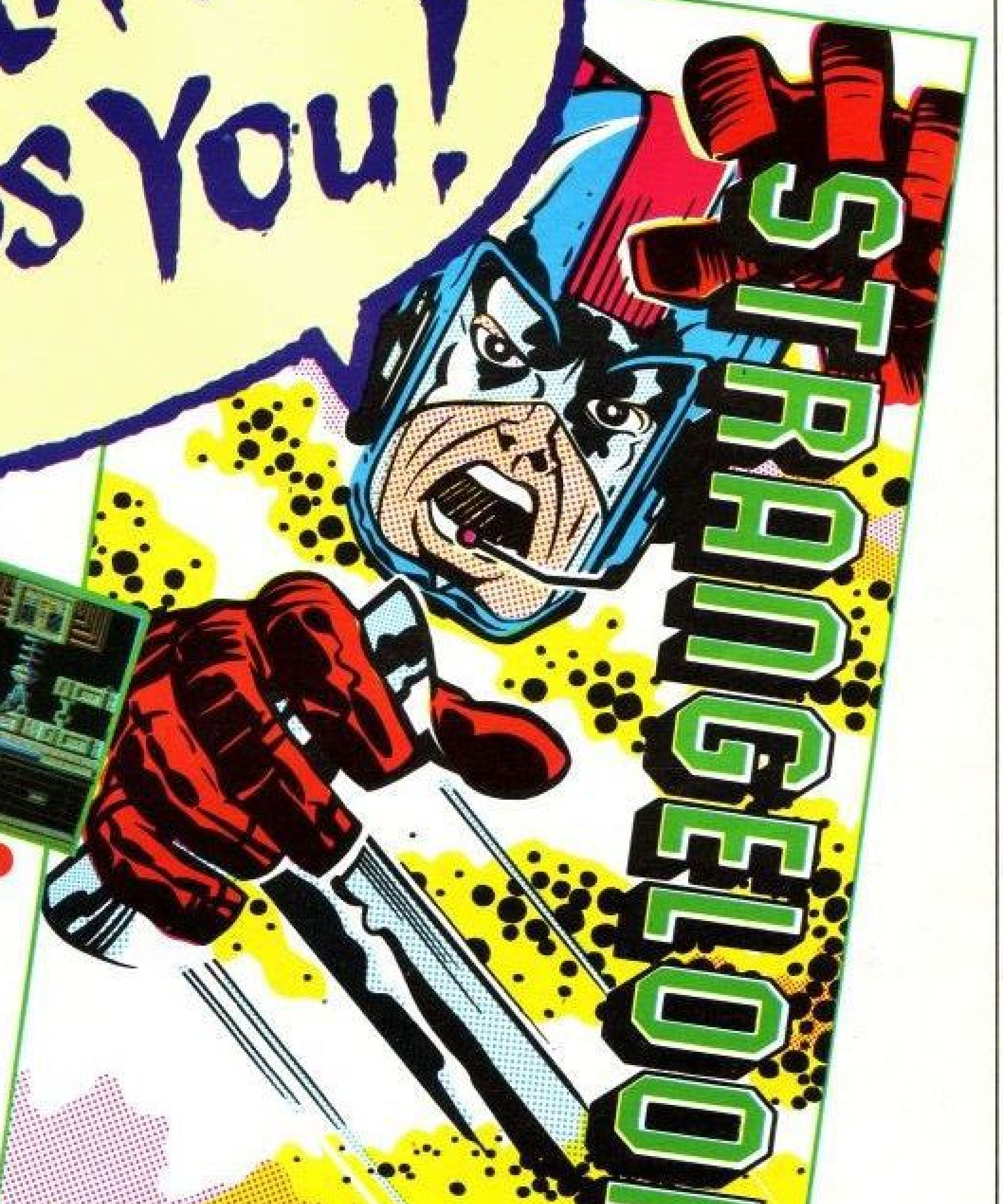
4 weeks up to 9/11/1985 ***Compiled for Microscope by* Gallup**

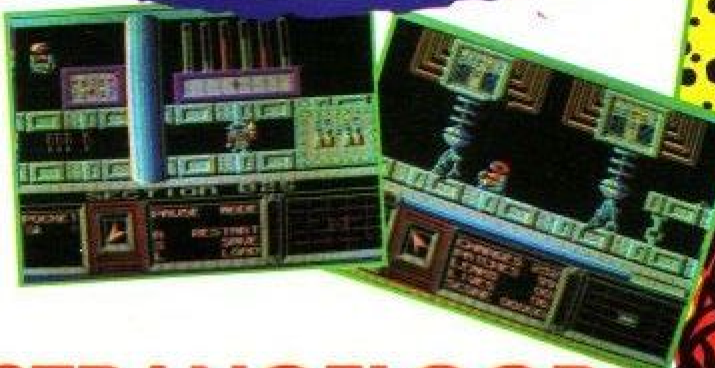
	TITLE Publisher	Last Month			Months in chart	Market Strength
1	FINDERS KEEPERS Master Tronic	5	▲	664	4	100
2	FORMULA ONE SIMULATOR Master Tronic	-	▲	???	1	88
3	SOUL OF A ROBOT Master Tronic	-	▲	664	1	87
4	NON TERRAQUEOUS Master Tronic	3	▼	664	4	85
5	WAY OF THE EXPLODING FIST Melbourne House	1	▼	664	4	77
6	3D GRAND PRIX Amsoft	-	▲	A 664 D	1	73
7	CHILLER Master Tronic	4	▼	664	4	67
8	FRANK BRUNO'S BOXING Elite	2	▼		4	65
9	HIGHWAY ENCOUNTER Vortex	13	▲	664	2	56
10	RAID !! US Gold	-	▲	A 664 D	1	55
11	LOCOMOTION Master Tronic	9	▼	???	3	49
12	STARION Melbourne House	8	▼	664	3	43
13	HACKER Activision	-	▲	???	1	42
14	SORCERY PLUS Amsoft	-	▲	A 664 D	1	39
15	LORDS OF MIDNIGHT Amsoft	10	▼	A 664 D	3	37
16	DRAGON TORC Hewson Consultants	11	▼	664	3	37
17	FIGHTER PILOT Digital Integration	20	▲	664	3	36
18	SCRABBLE Leisure Genius	7	▼	664	3	34
19	MATCHDAY Ocean	-	▲	???	1	33
20	AIRWOLF Amsoft	18	▼	A 664 D	3	29

D Available on Disc — 664 CPC 664/6128 Compatible — A Available from Amsoft — ??? Untested

SOFTWARE CHART







STRANGELOOP

The massive, desolate factory that services the EARTH orbits silently in the vast DARK WASTES of space.

STRANGE THINGS have been observed from EARTH, very strange indeed as there are NO HUMANS on the factory, it is maintained and controlled by a clever series of ROBOTS, programmed only to serve.

How could the ROBOTS possibly be SABOTAGING happenings on EARTH unless they are somehow being REPROGRAMMED? Intrepid investigation is the only way to find out exactly what is going on...and it must be YOU!

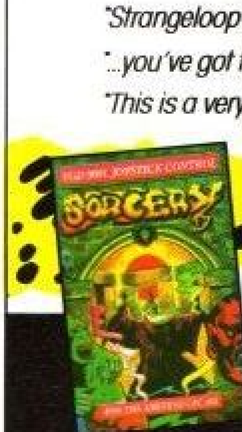
250 rooms of EXPLORATION, PUZZLES to resolve and CURIOUS ROBOTS to meet. GRAPHICALLY STUNNING, full of ACTION and AMUSING encounters, this is arcade adventuring at its absolute peak.

This what they were saying about STRANGELOOP before they even saw this version

"Strangeloop is unique, graphically impressive, vast, and devious; in short, brill..." **Personal Computing Weekly.**

"...you've got to use your brain as well as your joystick...Strangeloop graphics are superb...a real Screen Star if ever I saw one" **Commodore User**

"This is a very big and superior arcade adventure...an elegantly designed game" **Your Commodore.**



Remember "SORCERY", this year's most ACCLAIMED title for the AMSTRAD? Well VIRGIN GAMES' unrivalled reputation for AMSTRAD software is upheld again with the Gang of Five's latest MASTERPIECE.

The Devils Crown

Probe Software are a new name to the Amstrad, in fact they are a pretty new name to the world of computer software. The Devils Crown is a great way to make an entrance. This game is similar to Sorcery, you control a sprite which flies from room to room, picking up objects and taking them to a central place. The game has 40 rooms, the last four being hidden. From the beginning you are free to roam around the 36 main rooms which have been mapped here.

The theme of The Devils Crown is very different to that of Sorcery. You don't fly you swim instead. The game is set in a sunken wreck, an old pirate vessel full of treasure. Hidden in the wreckage is the ultimate prize, a golden crown. To find the crown you have to complete a number of tasks. To propel you through the water you have a mini-sub, however this sub is very mini and only allows you to carry one object at a time.

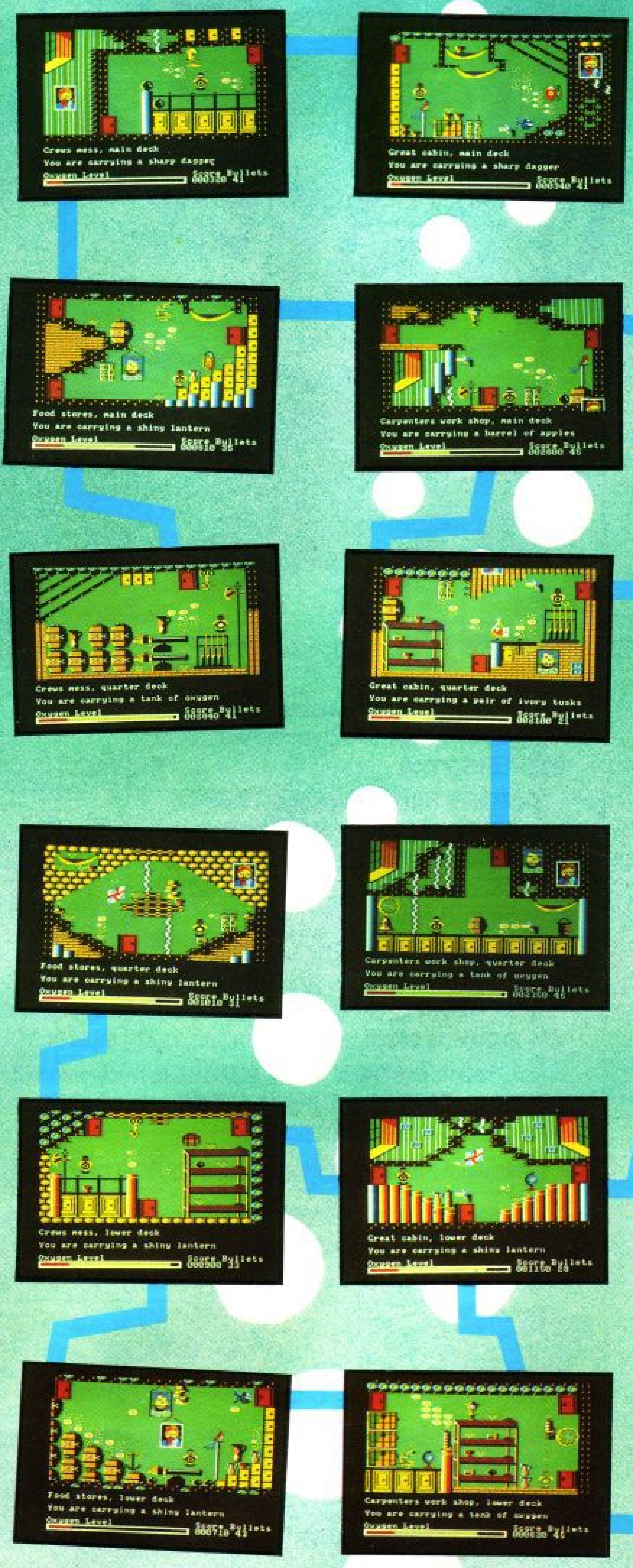
The Objects

All the objects have special properties. You soon learn that each gun only has fifty shots and you have to pick up a new one once you have exhausted the ammunition. Oxygen is a similar commodity, be thrifty with your consumption of oxygen there is only just enough in the ship to allow you to finish the game. The next most important object is the lantern, this allows you to see in the dark rooms. It is possible to leave a room illuminated by swapping the lantern for another object. The Harp is only there for entertainment. Some of the rooms contain ghosts. These force a swap with you, this may be fortunate since you may end up with something you need, however it is more likely that you will end up losing something you have just spent ages looking for. Ghosts can be immobilised with the armour and shield or they can be killed with the dagger.

The Tasks

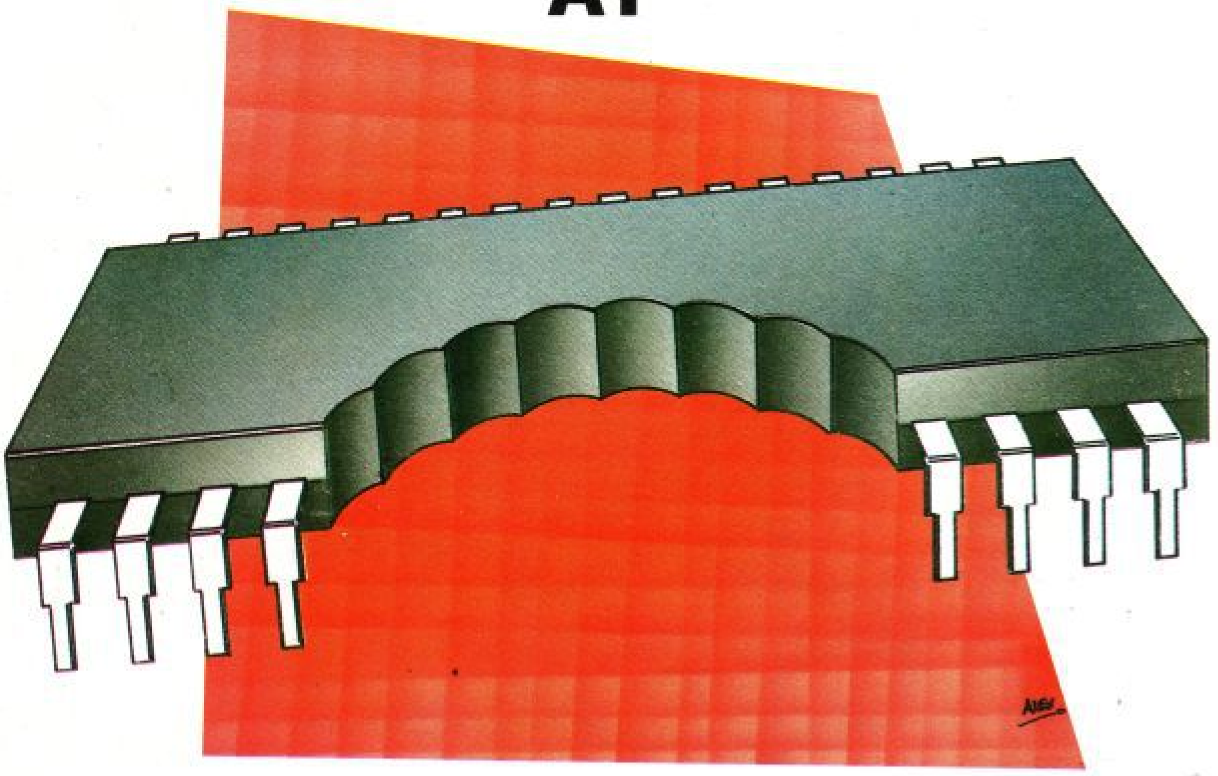
Your first task is to collect three bells, this is a fairly straightforward job. Then you have to collect the sapphires. These need a specific object to be dropped to allow you to pick them up, you will have to experiment to find out what you need. Just to get you started the first sapphire needs to be swapped for the ships wheel. The last sapphire is the trickiest of the lot. You need to drop a key onto a padlock just to make the jewel appear.

The Devils Crown is a game which wears well, there is so much to it that it must rate highly amongst the genre of arcade/strategy games.




Gun stores, main deck
Round house cabin, main deck
Dining saloon, main deck
Large cabin, main deck
Gun powder stores, main deck
Small cabin, main deck
Pantry, main deck
Cannon stores, main deck
Gun stores, quarter deck
Round house cabin, quarter deck
Dining saloon, quarter deck
Large cabin, quarter deck
Gun powder stores, quarter deck
Small cabin, quarter deck
Pantry, quarter deck
Cannon stores, quarter deck
Gun stores, lower deck
Round house cabin, lower deck
Dining saloon, lower deck
Large cabin, lower deck
Gun powder stores, lower deck
Small cabin, lower deck
Pantry, lower deck
Cannon stores, lower deck

FIRST BYTE AT



MACHINE CODE

By Ben Lewis

PART 3

Over the last two months I have been introducing the reasonably proficient BASIC programmer to machine code, in the hope that they will become reasonably proficient machine code programmers. These articles, of which this is the penultimate, only serve to whet the appetite but should lead the inexperienced by the hand to help them get over the initial barriers the world of machine code is surrounded by.

This month I shall be going over the SUB and SBC opcodes, taking a look at PEEKing and POKEing, and then moving onto the stack. But first, the problem I set you last month. How do you subtract one from C until C reaches zero, then RETurn to BASIC; without using SUB or DEC. Well, here is my solution (Figure 1).

FIGURE 1
A problem programmed.

```
START   LD C,number
L1      LD A,C
        DEC A
        ADD A,255
        INC A
        LD C,A
        JP C,L1
        RET
```

Can you see why this works? By adding 255 to A, we are in fact performing SUB 1 (subtract 1 from the A register), but with a small difference. When we expect a carry from SUB 1, we do not get it from ADD 'A-1',255. And when we expect a carry from ADD 'A-1',255; ie. when A is not 1 (A-1=0) then we do not get it from SUB 1. So by performing ADD 'A-1',255 when A is 1 will result in no carry, as A becomes zero in the operation. It isn't possible to perform ADD 'A-1',255 so this is achieved by DEC A followed by ADD A,255 followed by INC A. DEC and INC do not affect the value of the carry. If they did, the solution would not work. So when there is no carry, C has reached zero and the program ends.

Holding the Carry

Right, what about SUB and SBC? These opcodes are very similar to their ADD counterparts but with two differences. Firstly, SUB will obviously subtract instead of ADD (SBC subtracts with carry) and secondly you can only SUB from the A register alone. You can, however, SBC from the A and HL registers like ADD and ADC. These opcodes affect the carry flag in a similar way to ADD and ADC. Confused? Here is an example.

```
SUB B    means LET A=A-B
               LET carry=(256+B-A) MOD 256
SBC A,B  means LET A=A-B-carry
               LET carry=(256+B+carry-A) MOD 256
```

SUB always takes the forms SUB r or SUB n, since it can only be applied to the A register. SBC takes the forms SBC A,r or SBC HL,s or SBC A,n. Note, as before, you cannot mix registers and register pairs together in one opcode. The codes for SBC and SUB are given in Figure 2.

FIGURE 2
Hex-codes for SBC and SUB

SUB A	97	SBC A,A	9F	SBC HL,BC	ED42
SUB B	90	SBC A,B	98	SBC HL,DE	ED52
SUB C	91	SBC A,C	99	SBC HL,HL	ED62
SUB D	92	SBC A,D	9A		
SUB E	93	SBC A,E	9B		
SUB H	94	SBC A,H	9C		
SUB L	95	SBC A,L	9D		
SUB n	D6n	SBC A,n	DEn		

Look at the following three routines. One of them will subtract one from A and add 1

to DE. The other two may not. Which one and why?

```
ADD A,0       SBC A,1       SUB 0
SBC A,1       LD H,D        SBC A,1
LD H,D        LD E,L        LD H,D
LD E,L        ADD HL,1      LD L,E
ADC HL,1      LD D,H        ADD HL,1
LD D,H        LD E,L        LD D,H
LD E,L                      LD E,L
```

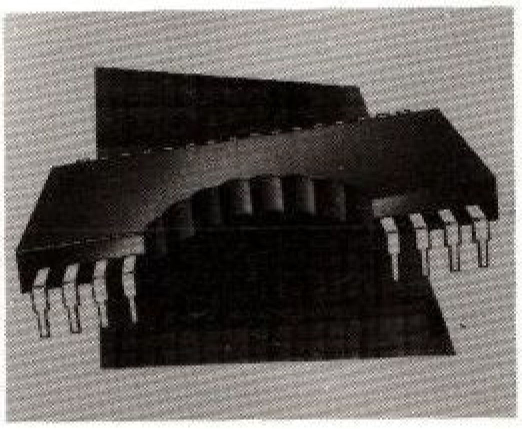
For a start, we can rule out the middle one. There is no instruction at the beginning to RESET the carry flag. ADD A,0 and SUB 0 will only reset the carry flag. If the carry flag is set then SBC A,1 will subtract 2 from A not one. In the same way, ADC HL,1 may add 2 to HL if A was originally 0 since SBC A,1 will then set the carry flag. So the third example is the only routine given that will ALWAYS carry out the job.

Moving Memory

PEEK and POKE, usually seen as the ominous elements of the BASIC instruction set, play a very important role in m/c. Practically any task requires the use of either PEEK or POKE or both. Even the more complicated opcodes really consist of a series of PEEKS and POKES. Why are they so important? They give a way of moving bytes of memory around. POKE A000,ED means put the byte ED in the address labeled A000. This does bear a resemblance to all Load commands discussed so far ie. moving bytes of memory around. Surprise surprise, we use the LD opcode to PEEK and POKE. It works like this. When referring to the contents of an address, for example A000 or even HL, we put brackets around. When referring to the byte or register we leave it alone.

```
So  LD (HL),C      means POKE HL,C
    LD (A000),A    means POKE A000,A
    LD (A000),DE   means POKE A000,E followed by
                         POKE A001,D
And LD A,(HL)      means A=PEEK(HL)
    LD HL,(A000)   means L=PEEK(A000) followed by
                         H=PEEK(A001)
```

This may all seem complicated at first but the basic rule to remember is that brackets mean: 'refer to the contents of the address specified by the number or register pair in the brackets'. Note the way that when dealing with register pairs, for example LD HL,(A000), the contents of A001 must be used also. This is due to the fact that HL is awaiting a 16-bit number, which can only be represented by two bytes, the one specified ie. (A000) and the next available byte (in this case, (A001)). Note that the low register, L, is loaded with the first byte, in a similar way to the coding of LD instructions for register pairs. Note also that (A000) is a single byte number when used with r and a two byte number when used with s (remember r is any single register, s is a register pair), in keeping with the rule of never mixing registers and register pairs.



Look at the following.

```
7000  2100C0        LD HL,&C000
7003  110100        LD DE,1
7006  7E        L1  LD A,(HL)
7007  87            ADD A,A
7008  77            LD (HL),A
7009  19            ADD HL,DE
700A  D20670        JP NC,L1
700D  C9            RET
```

Type it into HEXLD, the hex-loader program I gave you in the first article and run it. Can you see how it works? If you can recall, I went over the MEMORY MAPPING of the Amstrad in the same article. The screen memory starts form &C000, and is &4000 bytes long. Each byte is replaced by another which is twice the value. This is achieved by using ADD A,A. Can you see what effect this will have on the byte, by picking a random bit pattern to represent a value of A, and calculating the resulting bit pattern after ADD A,A? This routine is particularly effective when run in mode 2 with text on the screen. Since the last byte of screen memory is &FFFF, then the program is halted by checking for an overflow, ie. when &FFFF is incremented. INC cannot be used for this, since it will not effect the carry flag, so ADD HL,DE where DE is one is used. Some hex-codes for PEEK and POKE are given in Figure 3.

FIGURE 3

Some PEEK and POKES: pq is any address.

PEEK		POKE	
LD A,(pq)	3A	LD (pq),A	32
LD BC,(pq)	ED4B	LD (pq),BC	ED43
LD DE,(pq)	ED5B	LD (pq),DE	ED5B
LD HL,(pq)	2A	LD (pq),HL	22
LD A,(BC)	0A	LD (BC),A	02
LD A,(DE)	1A	LD (DE),A	12
LD A,(HL)	7E	LD (HL),A	77
LD B,(HL)	46	LD (HL),B	70
LD C,(HL)	4E	LD (HL),C	71
LD D,(HL)	56	LD (HL),D	72
LD E,(HL)	5E	LD (HL),E	73
LD H,(HL)	66	LD (HL),H	74
LD L,(HL)	6E	LD (HL),L	75

I hope you have got the hang of PEEKing and POKEing in m/c; if not, don't worry since this ground is trodden on many a time and plenty of examples will crop up. The STACK, which I promised I would discuss, is really just a stretch of memory held somewhere in the system variables, but is a very special stretch of memory as far as the Z80 is concerned, and indeed the programmer. It is used to store numbers in a special way, and the name is not as crazy as it sounds. Imagine a stack of cardboard boxes, one on top of another, where each box is really a memory location. If you want to look inside one of the boxes, the only practical way is to remove the top box and then the one underneath and so on until you get to the one you are interested in. Conversely, the only way to add a new box to the stack is to place it on the very top.

The memory locations in the MACHINE STACK work in a very similar way. You can only look at the 'box' on top, or add one to the top. The only way to look at the 'box' on the top is to actually remove it. There are two opcodes which are used with the stack, one has the effect of putting a number on the top of the stack, the other removes a number from the top of the stack, since it is numbers not boxes we are concerned with in m/c. These opcodes are PUSH and POP, and will only work with register pairs. As with all opcodes, PUSH and POP only copy the contents of address or register pair - not move the contents. 'Ah,' I here you say,'You said you actually remove the number from the top of the stack'. Well, you don't remove the number, which is incidentally TWO BYTES, since the register pair can hold two bytes. Instead, you move what is called the STACK POINTER, which is as its name implies a pointer which points to the top of the stack. When a number is removed, the stack pointer (SP for short) is moved down to point to the number below the top number, which then becomes 'the top'. The workings of the stack are unimportant, but for those who are interested, I have summarised the workings below. Note, SP is a register pair and can be used only as a register pair, ie. cannot be split into single registers.

```
PUSH HL   means   POKE SP-1,H
                  POKE SP-2,L
                  LET SP=SP+2

POP HL    means   LET L=PEEK(SP)
                  LET H=PEEK(SP+1)
                  LET SP=SP-2
```

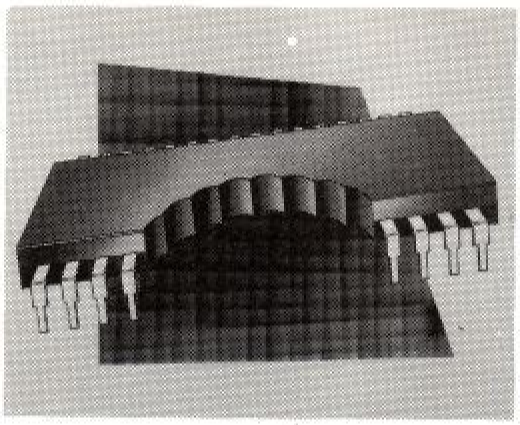
All you have to remember is last on, first off. The use of the stack is to preserve the contents of register pairs so that they can be used for other purposes. The codes for PUSH and POP are given in Figure 4.

FIGURE 4
Hex-codes for PUSH and POP

PUSH AF	F5	POP AF	F1
PUSH BC	C5	POP BC	C1
PUSH DE	D5	POP DE	D1
PUSH HL	E5	POP HL	E1

You will notice a strange looking register pair AF. This, as with HL is made up of single registers A and F. A we are all familiar with, but F is something new and I will discuss it next month. All you have to remember for now is that to preserve the value of A, use PUSH AF, and to recall the value of A, use POP AF. Note, POP AF corrupts the value of the carry flag, so use with caution. OK, look at the following routine.

```
PUSH AF
LD A,C
ADD A,4E
LD C,A
POP AF
```



Can you see that I have managed to add 4E to C without using any other register. The value of A was preserved, and then recalled when the short routine was over - a very useful commodity you will agree, but not without its hazards. Whatever you do, always use the same number of PUSHes and POPs in the same suboutine, or you will cause the computer to crash. You can think of it in a similar way to a FOR-NEXT Loop ie. always the same number of NEXTs as FORs in the same subroutine. Also remember, do not POP without PUSHing first. The following programs will crash!

```
    POP HL
    RET
    CALL L1
    RET
L1  PUSH HL
    RET
```

You may be wondering why this is. It is beyond the scope of these articles, and is not too important for the novice to know.

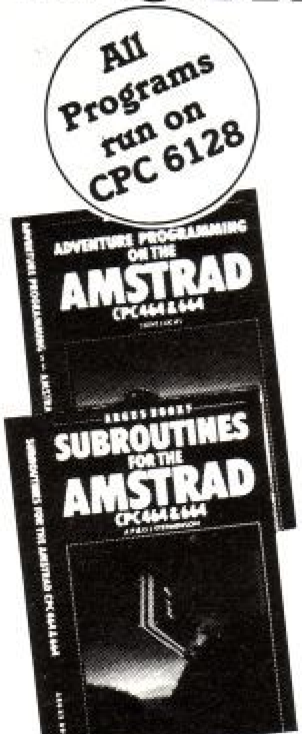
To check that you have got the hang of PEEKing and POKEing and the stack, try to write a program that will add one to every byte on the screen 255 times, so that the screen remains unchanged after the program has ended (Hint-refer back to the program I gave you to illustrate PEEKing and POKEing).

Next month, just to round things off, I will include a small dictionary of m/c opcodes covered in this short series together with an explanation of the F register and a couple more opcodes.

ACU

Happy Coding!

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Defeat The Necromancer

Sorcery+ made a bit easier and a little more fun. Chris Wood explains how.

WARNING: The programs in this article make permanent changes to your Sorcery+ disc. Whilst every effort has been made to ensure that these programs are sound Amstrad User will not accept responsibility for the misuse of the listings. We recommend that you only experiment with one side of your disc.









'Wow!', 'Brilliant!', 'Marvellous!', 'Well I'll go to the foot of our stairs!' These are just some of the things most people said when 'Sorcery' was first released on the market last year. This one program did more to raise the standard of Amstrad games software than any other. The 'gang of five' have improved on the best with 'Sorcery+. The first game to be so big has to load parts of itself off disc as it plays, rather than just using the disc as a faster way to load the game It should be interesting to see what the 'gang of five' come up with next.

As the sprites are so colourful and detailed I soon began to play with my disc to see if there was any way to get at them, examine them more closely, alter them and, if possible, write them back to the disc. This is not as drastic as it sounds, as you have two copies of the program on the disc (one on each side) and it is easier to make a back up copy of a single disc file than a selected part of a normal tape game, that is if you can find the graphics in the first place. The sprites are stored in two obviously named files called 'SPRITES1.BIN' and 'SPRITES 2.BIN' which makes thing a little easier for a start. SPRITES1.BIN is used by the first part of the game and SPRITES2.BIN by the 'Plus' bit.

If you put your disc in the drive and type 'CAT' you will only get 'DISC.BAS*' appearing on the screen; this is because the programs have been hidden from the directory using CP/M, the '*' after the filename means it has been made a 'Read Only' file so that you cannot erase it from the disc.

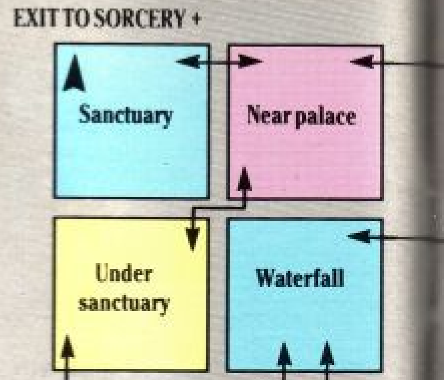
Unmasking the Sprites

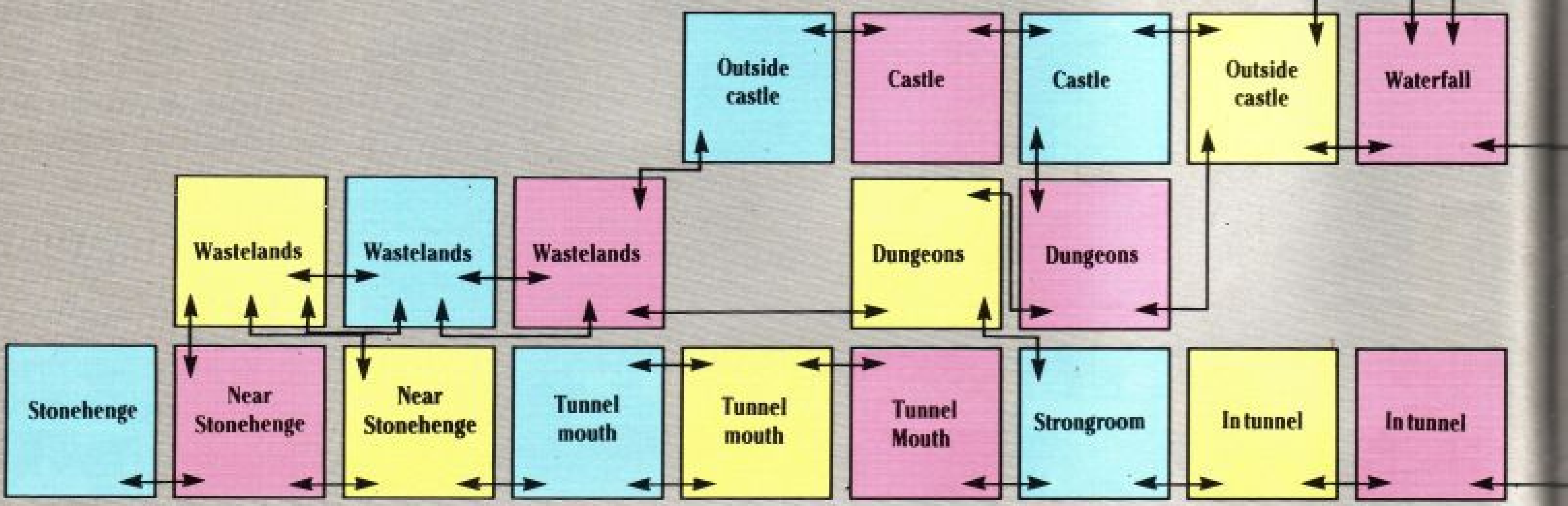
The files 'SPRITES1.BIN' and 'SPRITES 2.BIN' have been similarly made 'Read Only' as well as hidden from your view, so armed with Hisoft's 'Knife2' I set about finding how to change this. It is a fairly simple operation and so I have written the first program for you to do this. I should point out to the 'gang of five' and anyone at Amsoft or Virgin reading this that this in no way helps you to copy the game. *(Phew!- Ed)*

Type in, save and run the first program. As it is potentially possible to accidentally erase or otherwise muck up parts of the disc you have just spent the best part of fifteen quid on, the program is *very* extensively error checked. I think I have checked for just about every possibly thing that you could get wrong if you mis-type the DATA. Firstly it checks whether you have typed in a valid HEX number, and has a checksum after every eight bytes. As you could possibly swap around two numbers in a line and still get the same ckecksum for the line, the program also has a vertical checksum for all the lines. There is a checksum for all the first numbers in each line, all the second numbers, and so on. If you just get the numbers wrong you will be told which line to check, but if you get a 'VERTICAL CHECKSUM' error then you must check all of them, as there is no way of knowing which numbers you have swapped around. Also check that you have typed in the checksums themselves correctly. Under no circumstances should you fiddle with the checksums or the checking routines. They are there for your own protection.

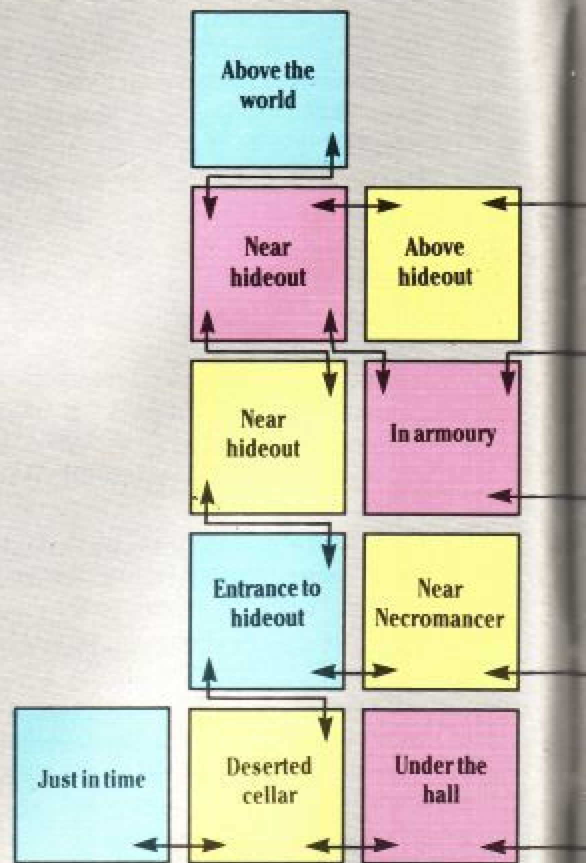
Although this method *should* stop all errors – including the flukes where you type in the numbers in a line incorrectly and also type in the wrong checksum that gives the right total for the line – the magazine cannot accept any responsibility for damage to this or any other disc which may result


OFF
0123456789ABCDEF
SPACE to select
S to save.
P for pen.
N for next.
COPY pen on/off.

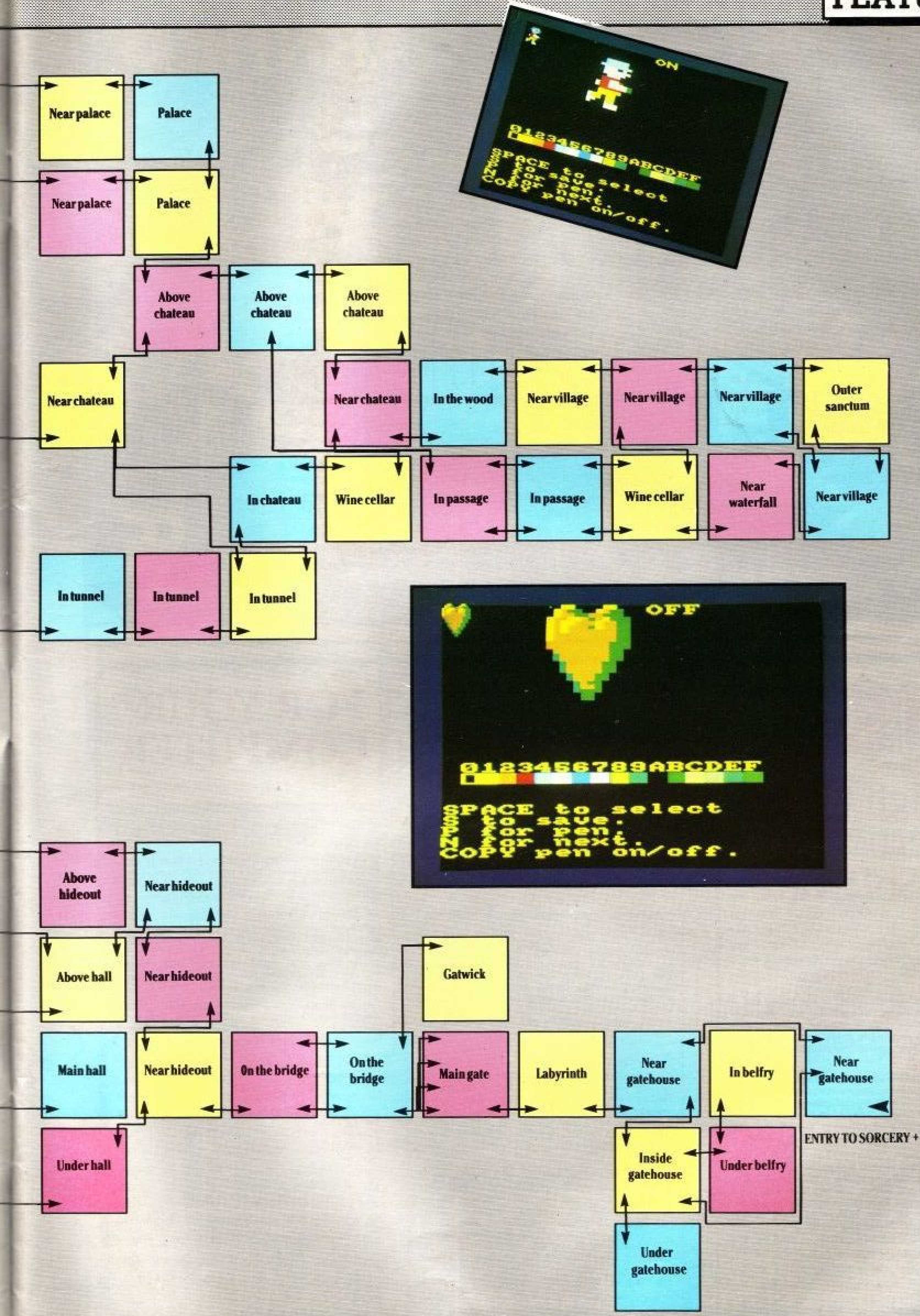

EXIT TO SORCERY +
Sanctuary
Near palace
Under sanctuary
Waterfall


Outside castle
Castle
Castle
Outside castle
Waterfall
Wastelands
Wastelands
Wastelands
Dungeons
Dungeons
Stonehenge
Near Stonehenge
Near Stonehenge
Tunnel mouth
Tunnel mouth
Tunnel Mouth
Strongroom
In tunnel
In tunnel


you are in the tunnel.


Above the world
Near hideout
Above hideout
Near hideout
In armoury
Entrance to hideout
Near Necromancer
Just in time
Deserted cellar
Under the hall


OFF
0123456789ABCDEF
SPACE to select
S to save.
P for pen.
N for next.
COPY pen on/off.


ON
0123456789ABCDEF
SPACE to select
S to save.
P for pen.
N for next.
COPY pen on/off.
Near palace
Palace
Near palace
Palace
Above chateau
Above chateau
Above chateau
Near chateau
Near chateau
In the wood
Near village
Near village
Near village
Outer sanctum
In chateau
Wine cellar
In passage
In passage
Wine cellar
Near waterfall
Near village
In tunnel
In tunnel
In tunnel
OFF
0123456789ABCDEF
SPACE to select
S to save.
P for pen.
N for next.
COPY pen on/off.
Above hideout
Near hideout
Above hall
Near hideout
Gatwick
Main hall
Near hideout
On the bridge
On the bridge
Main gate
Labyrinth
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HISOFT

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```
80 POKE 30007,INT(N/256):POKE 30006,N-(P
   EEK(30007)*256):POKE 30013,235:POKE 3
   0016,235:CALL 30000
90 K$=INKEY$:IF K$="" THEN GOTO 90
100 IF K$=" " THEN GOSUB 280:GOTO 120
110 GOTO 240
120 PRINT CHR$(23);CHR$(1);:PLOT 184+x*3
    ,396-y*3,pp:PRINT CHR$(23);CHR$(0);:
    pp=pp+1:pp=(pp MOD 15)
130 k$=INKEY$:IF k$="" THEN GOTO 120
140 kk=ASC(k$)
150 PLOT 184+x*3,396-y*3,TEST(x,398-y)
160 x=x-4*((kk=&F3 AND x<>44)-(kk=&F2 AN
    D x<>0))
170 y=y-2*((kk=&F1 AND y<>46)-(kk=&F0 AN
    D y<>0))
180 IF k$="p" OR k$="P" THEN LOCATE 1,18
    :INPUT;"pen";q$:q$=q$+"0":q=VAL("&"+
    LEFT$(q$,1)):LOCATE 16,1:PRINT "pen
    ";HEX$(q)
190 IF kk=224 THEN te=1+(te=1):LOCATE 12
    ,1:PRINT "OFF":IF te=1 THEN LOCATE 1
    2,1:PRINT"ON "
200 IF k$="s" OR k$="S" THEN POKE 30013,
    0:POKE 30016,0:CALL 30000:GOTO 240
210 IF k$="N" OR k$="n" THEN GOTO 240
220  IF te=1 THEN FOR z=0 TO 2:PLOT 180+
    x*3,398-y*3-2*z,q:DRAWR 8,0,q:NEXT:P
    LOT x,398-y,q:tt=TEST(x,398-y)
230 GOTO 120
240 NEXT N:GOTO 50
250 FOR N=0 TO 15:READ A:INK N,A:NEXT
260 RETURN
270 DATA &00,&18,&0F,&06,&14,&1A,&0E,&11
    ,&12,&0A,&03,&09,&19,&13,&0D,&0C
280 FOR Y=0 TO 46 STEP 2:FOR X=0 TO"44 S
    TEP 4:FOR z=0 TO 2:PLOT 180+x*3,398-
    y*3-2*z,TEST(x,398-y):DRAWR 8,0:NEXT
    :NEXT:NEXT:x=0:y=x
290 RETURN
1000 CALL 30025:REM DECRYPT
1010 END
1020 CALL 30045:REM RE-ENCRYPT
1030 END
1040 REM START=6144,SIZE=13824
```

The Happy Hacker

You will have noticed that there is a fifth program. If you haven't have a look. This program will allow you to 'Hack' the game. It is just like putting Infinite lives POKEs etc. into a game except you do it directly to the disc.

As before you load and run program 1 to set up the sector read/write machine code. Then type in the 'hacking' program. Don't worry, this program is just as extensively error checked as the first one. Remember to save it before running. Program 5 first checks all the data with a checksum for each line, then to see if the machine code is in memory, it then checks whether you have the right disc in the drive, and finally whether you have typed in a string properly which will be used for some of the POKEs. As if that wasn't enough, before it POKEs it checks to see what is already in memory. If not then you have swapped around some of the numbers in the data lines, and have got the equivalent of a vertical checksum error. This program does not have an actual vertical checksum because if the nature of the data, but this should trap any errors.

What is Practice Mode

If you are clever enough to have finished the first part of Sorcery and actually got into the 'Plus' bit, you will have seen the message 'Practice Mode now available..', and wondered what it meant. Well it is a bit rotten of the 'gang of five' since this is not mentioned anywhere, but if you hold down the 'C' key and the fire button at the same time, then, when you start the game you will get the message 'CHEAT BUT YOU WON'T GET FAR...', you then will find yourself on the 'Plus' part of the game. The only disadvantage is that you don't get any score and some of the later rooms are permanently locked, this means you can't get to the Necromancer. However, practice mode is a good way to see the new graphics. Some people who can't play the first part may never get to see the 'Plus' bit except when the game goes in demo mode. An undocumented feature is that if you press the 'S' key when it is loading it will go into a different demo which just flips between the large SORCERY+ screen and the high score tables, In this mode you can remove your disc without the program resetting. This is really for shop-keepers who can leave it Demoing without the danger of someone half-inching the disc, although it also means you don't have to wait so long to read all the scrolling messages.

If all is well, you have loaded the machine code, and put the 'Sorcery+ disc in the drive. Program 5 will be ask you if you want 'Practice Mode' available? If you reply 'Y' to the prompt then you will always be able to get to the practice mode by holding down the 'C' key. The second option asks you if you want 'Infinite Energy'. If you reply 'Y' then none of the sprites in the game will harm you, although you can still die by drowning. If you answer 'N' then you will remain vulnerable, or will become vulnerable if you have previously said 'YES'.

The last option asks you 'How many sorcerers'. It will accept a number between zero and eight, and is the number of sorcerers you must rescue before being allowed to go to the 'Plus' part. If you select zero you can go straight into the 'Plus' bit through the door in 'Sanctuary' with the advantage that, unlike practice mode, you can score, and none of the rooms are locked. To change this back to normal you simply enter '8' when asked. As you can see all of the features can be turned off so your disc is back to normal on both sides if you want it. Personally I have practice mode available, infinite energy and seven sorcerers to collect, because I always drown trying to get the book of spells for the eighth one.

I must point out that there are three lines of data which tell the program where to put the POKEs for the number of sorcerers; lines 610, 620 and 630. I found that only the first two POKEs are neccessary to alter the number of sorcerers but the last one alters a bit of code that was also checking on the number of sorcerers and as I wasn't sure if it does this when you are in the 'Plus' bit somewhere or not, I put it in anyway. If you find that you cannot go somewhere in the 'Plus' part you may like to change line 630 to be the same as line 620 and also make the last two numbers in line 650 the same, and see if it makes any difference.

```
10 'Program 5
20 'PROGRAM TO ALTER OR RESTORE
30 'PARTS OF SORCERY PLUS.
40 'By CHRIS WOOD for ACU
50 '
60 RESTORE 560:DIM w(6):FOR n=1 TO 6
70 READ a:READ b:READ c:READ a$:READ b$
80 w(n)=w(n)+a+b+c
90 w(n)=w(n)+VAL("&"+a$)+VAL("&"+b$)
100 NEXT n:FOR n=1 TO 6:READ a
110 IF w(n)=a THEN NEXT n:GOTO 130
120 PRINT"ERROR in DATA line";n:END
130 D$="B6B4B2B0AEACAAA8A6"
140 RESTORE 560
150 IF PEEK(20000)=62 THEN GOTO 170
160 PRINT"Please LOAD CODE first.":END
170 POKE 20032,0:POKE 20034,193
180 CALL 20000:a=PEEK(30001)
190 IF a=21 THEN GOTO 210
200 PRINT"Wrong disc SILLY!!!":END
210 TOT=0:FOR N=1 TO 18
220 G=VAL("&"+MID$(D$,N,1))
230 TOT=TOT+G:NEXT N
240 IF TOT<>156 THEN PRINT"ERROR IN 60":
    END
250 PRINT"Practice Mode available(Y/N)"
260 GOSUB 400
270 PRINT"Infinite Energy (Y/N)"
280 GOSUB 400:GOSUB 410
290 INPUT "How many Sorcerors";n
300 IF n<0 OR n>8 THEN GOTO 290
310 n=n*2:k$=MID$(d$,n+1,2)
320 k=VAL("&"+k$)
330 FOR n=1 TO 3
340 READ t:READ s:READ a
350 READ a$:READ b$
360 POKE 20032,t:POKE 20034,s+192
370 CALL 20000:POKE a,k:CALL 20007
380 NEXT:END
390 '
400 INPUT C$:c$=UPPER$(c$):c$=c$+" "
410 READ t:READ s:READ a
420 READ a$:READ b$
430 l$=a$:IF LEFT$(c$,1)<>"Y" THEN l$=b$
440 POKE 20032,t:POKE 20034,s+192
450 CALL 20000
460 FOR n=1 TO LEN(a$) STEP 2
470 r=VAL("&"+MID$(l$,n,2))
480 j=VAL("&"+MID$(a$,n,2))
490 k=VAL("&"+MID$(b$,n,2)):q=PEEK(a)
500 IF q<>j OR q<>k THEN GOTO 520
510 PRINT"ERROR in DATA":END
520 POKE a,r:a=a+1:NEXT
530 CALL 20007:RETURN
540 '
550 'Practice Mode Available.
560 DATA 8,2,30312,"B6B6","6620"
570 'Infinite Energy
580 DATA 8,5,30230,"B6B6","09B4"
590 DATA 9,3,30088,"B6B6","09B4"
600 'Number of Sorcerers
610 DATA 8,7,30203,"0000","0000"
620 DATA 8,7,30330,"0000","0000"
630 DATA 9,3,30318,"0000","0000"
640 DATA 37704,13965,13822
650 DATA 30218,30345,30330
```

from your misuse of the program, although as I said it shouldn't be possible.

What the first program does is read and write sectors from the disc, two of the following four programs will use it to alter the data on your disc.

```
10 'Program 1.
20 'SECTOR READ/WRITE ROUTINE
30 'FOR EDITING SORCERY PLUS.
40 'By CHRIS WOOD for ACU
50 '
60 MEMORY 19999:h=20000:DIM s(8)
70 lin=1000:add=h:FOR t=1 TO 48 STEP 8
80 chk=0:FOR b=0 TO 7
90 READ a$:a$=UPPER$(a$):n=1
100 IF LEN(a$)<>2 THEN GOTO 250
110 b$=MID$(a$,n,1)
120 GOSUB 230:IF a=0 THEN GOTO 250
130 n=n+1:IF n=2 THEN GOTO 120
140 p=VAL("&"+a$):POKE add,p
150 add=add+1:chk=chk+p
160 s(b+1)=s(b+1)+p
170 NEXT b: READ a
180 IF a<>chk THEN GOTO 250
190 PRINT "Line";lin;"OK":lin=lin+10
200 NEXT t:FOR n=1 TO 8:READ a
210 IF s(n)=a THEN NEXT:END
220 PRINT"VERTICAL CHECK ERROR":END
230 a=INSTR("0123456789ABCDEF",b$)
240 RETURN
250 PRINT"ERROR in line";lin:END
1000 DATA 3E,84,32,4A,4E,18,05,3E, 487
1010 DATA 85,32,4A,4E,21,4A,4E,CD, 725
1020 DATA D4,BC,D0,22,47,4E,79,32, 962
1030 DATA 49,4E,21,30,75,1E,00,16, 401
1040 DATA 01,0E,C2,DF,47,4E,C9,00, 782
1050 DATA 00,00,84,00,00,00,00,00, 132
1060 DATA 481,462,691,457
1070 DATA 370,284,405,339
```

When you have typed in and saved the program, type in and run the small second program. All this does is read in one of the Directory sectors, change the bytes that are hiding the Sprite files from your view and saves them back out again. It also CATalogues the disc so you can see they are there. You do not need to save this second program, it is very short and you will not need it again. I do suggest that you only use this, and any other of the programs, on one side of the disc and keep the other side virgin (sorry, I couldn't resist the pun).

```
10 'Program 2
20 'PROGRAM TO REVEAL FILES
30 'SPRITES1 and SPRITES2.
40 'IN DISC DIRECTORY
50 'By CHRIS WOOD for ACU
60 '
70 POKE 20034,193:POKE 20032,0
80 CALL 20000:a=PEEK(30001)
90 IF a=21 THEN GOTO 110
100 PRINT"Wrong disc SILLY!!!":END
110 POKE 30265,&42:POKE 30266,&49
120 POKE 30297,&42:POKE 30298,&49
130 CALL 20007:CAT
```

Okay, the first thing I suggest you do is make back up copies of the SPRITES code blocks, so you can reload them if you really mess them up with the editor. Enter this;

```
MEMORY 6143: LOAD "SPRITES1.BIN"
```

swap discs to one of your own and enter this;

```
SAVE "SPRITES1.BIN", B, 6144, 13824
```

Do the same with SPRITES2.BIN. If you lose this article *(and are too mean to buy a backnumber - Ed)* there is a REM statement in LINE 1040 of the Sprite editor which will remind you of the block sizes.

Essential Machine Code

Type in, save and run the third program. It is also error checked but not as extensively, it doesn't have the vertical checksums. The program sets up some machine code for program 4, the sprite editor. The code prints the sprites on the screen, saves them back into memory if you alter them, it also de-crypts and re-encrypts the sprite code. This is because all the running code on the disc has been altered so as to make it unreadable to the casual hacker, this is not a problem if you follow the simple instructions.

```
10 ' Program 3
20 ' To be run before loading Editing
30 ' Program (No.4).
40 ' by CHRIS WOOD for ACU
50 '
60 MEMORY 6143:h=30000
70 lin=1000:add=h:FOR t=1 TO 72 STEP 8
80 chk=0:FOR b=0 TO 7
90 READ a$:a$=UPPER$(a$):n=1
100 IF LEN(a$)<>2 THEN GOTO 220
110 b$=MID$(a$,n,1)
120 GOSUB 200:IF a=0 THEN GOTO 220
130 n=n+1:IF n=2 THEN GOTO 120
140 p=VAL("&"+a$):POKE add,p
150 add=add+1:chk=chk+p
160 NEXT b: READ a
170 IF a<>chk THEN GOTO 220
180 PRINT "Line";lin;"OK":lin=lin+10
190 NEXT t:END
200 a=INSTR("0123456789ABCDEF",b$)
210 RETURN
220 PRINT"ERROR in line";lin:END
230 DATA 06,18,21,00,C0,11,00,18, 296
240 DATA C5,01,06,00,E5,EB,ED,B0, 1081
250 DATA EB,E1,CD,26,BC,C1,10,F0, 1340
260 DATA C9,21,00,18,01,06,36,7E, 445
270 DATA ED,44,0F,D6,25,77,23,0B, 736
280 DATA 78,B1,20,F3,C9,21,00,18, 830
290 DATA 01,06,36,7E,C6,25,07,ED, 666
300 DATA 44,77,23,0B,78,B1,20,F3, 805
310 DATA C9,00,00,00,00,00,00,00, 201
```

The Editor

Type in and save program 4, which is the editor itself. You are now ready to edit the sprites. You must run the third program to set up the machine code before running this program. When it is in type as a direct command;

```
LOAD "SPRITES1.BIN":GOTO 1000
```

As you will see from the listing line 1000 de-crypts the Sprite code. You can now run the program and the pens will be set up to those in 'Sorcery+ and you should be greeted with a small menu and a small orange sprite in the top left hand corner of the screen. Of course if you loaded SPRITES2.BIN you will get a different sprite. Pressing 'N' will show you the next sprite and when you have seen them all they go back to the beginning. Press SPACE and you will get a large version of the sprite in the middle of the screen. Move around with the cursor keys and turn the present pen on and off with the COPY key. Pressing the 'P' key will allow you to select a new pen. When you select a new pen you are told in the top left corner of the screen which one it is and whether it is on or off. When you have finished editing the sprite you press 'S' to save it in memory and overwrite the original or pressing 'N' again will take you to the next one and leave the one in memory intact, although it will remain in enlarged form on your screen until you select another one to edit. When you have finished editing them Break out of the program and then enter as a direct command;

```
GOTO 1020
```

This will re-encrypt the data for it to be saved on disc. If you forget to do this you will get very strange looking sprites when you play the game. Similarly if you forget to de-crypt them before running the editor program you will get very messy looking sprites to edit.

Right, now put in your 'Sorcery+ disc and erase the sprites from it. Yes, *before* you save the new ones. This is because the sprites must go in the same place on the disc that the originals were. To do this you must erase them first, then when they are saved they will be put in the first free space on the disc which is where the original ones were. The need to erase the sprites is another reason that I suggested you make backup copies. Remember the design of the sprites are protected by Amsofts' copyright so you should only keep the backup of the sprites for your own use.

Now you can save your new sprites with;

```
SAVE "SPRITES1.BIN",B,6144,13824
```

If you want to make the game really difficult, you could save SPRITES1 as SPRITES2 and vice-versa, although this would mean erasing SPRITES1, saving SPRITES2 in their place, erasing SPRITES2 and loading your back-up copy of SPRITES1 in their place.

```
10 'Program 4
20 'Sprite Editor.
30 'By CHRIS WOOD for ACU
40 RESTORE:GOSUB 250:MODE 0:PRINT CHR$(2
   3);CHR$(0)
50  LOCATE 2,17:PRINT CHR$(1);CHR$(0);:F
   OR N=1 TO 15:PEN N:PRINT CHR$(143);:N
   EXT:PEN 1:LOCATE 2,16:PRINT"012345678
   9ABCDEF":LOCATE 12,1:PRINT"OFF"
60 LOCATE 1,20:PRINT"SPACE to select":PR
   INT"S to save.":PRINT"P for pen.":PRI
   NT"N for next.":PRINT"COPY pen on/off
   ."
70 FOR N=6144 TO 6144+13824-144 STEP 144
```

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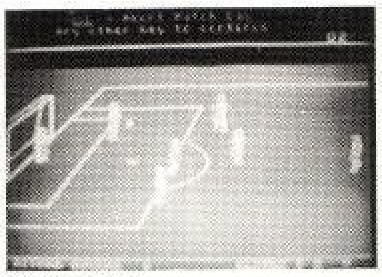
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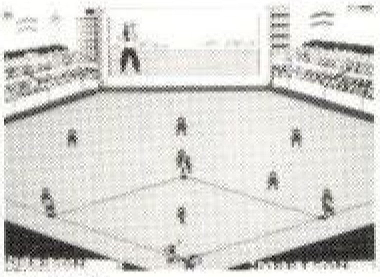
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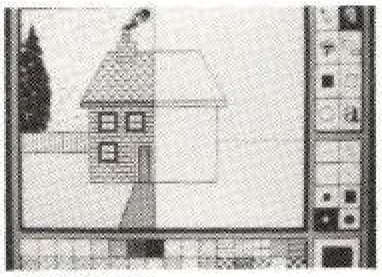
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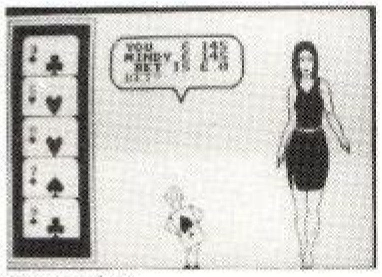
Match Day



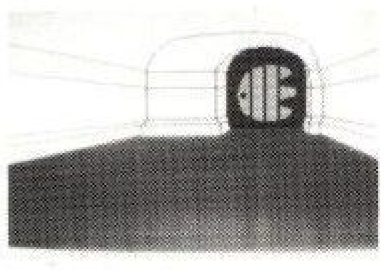
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Rainbow Listings

VAX plays with a new colour printer and finds it a little disapointing

This is a fairly large printer (6 kilos of it) that comes from the DMP-1 and Commodore cheapo printer stable. It is based on the unihammer design and therefore makes the classic 'I am a liquidiser' noise at quite a volume.

The top of the printer displays a formidable array of three LED's (little lights) and four push-button switches. The first three of these; stop, line feed and form feed, are self-explanatory. The fourth is labelled 'COPY' and seems to do very little and the manual mentions something about additional hardware but does not say what for, what it does, or how much it costs.

The print quality is about the same quality as you would expect of a DMP-1. That means it prints normal or wide, descenders don't, no italics or underline and the printout looks very dot-matrix-ish.

A few refinements have been added however,which raise it above the DMP-1. It takes both tractor and friction feed paper, prints in colour and can print text in 10 cpi or 13.3 cpi as well as double width in either mode.

When printing in 10 cpi, the character matrix is 7 dots horizontally and 8 dots vertically. Changing to 13.3 cpi does not alter the dot spacing but changes the actual character set to one of 5 dots horizontally. There is no provision for super or subscript.

The documentation claims the print head can turn out an original and two copies. Colour, of course, is only on the original. It can manage form feeds of variable length, and text can be printed at any dot position on a line. The print speed has dropped a bit though to 50 characters a second but this does not vary when you print in colour.

At the mention of the word 'colour', comparison with the Okimate 20 becomes inevitable. There really is no comparison in the quality stakes, the Oki wins by a mile. The print quality of the colour text is quite passable but screen dumps are abysmal. It only prints in 8 colours and leaves gaps all over the printout.

Software is provided (as menu and non-relocatable RSX's) to dump the screen and the resulting dump is physically bigger than the Oki one. The bad news is that it only dumps eight colours, and that these colours are dependent on the pen number, not the ink number. In short, you have to set up the colours. The manual shows you how to do this but gets a little confused between pens and inks itself. Also, there is no 'screen snapshot' facility as with the Oki software. To be fair though, it came with more instructions than the Oki software (note : they were not printed on a GP-700 printer) and had a screen loader/dumper program on the tape. One parting shot at the software, it didn't work on the 6128.

The colours are all handled by escape codes and the odd control character. Some of these modes are not open to 464-6128 users as they use all eight bits of the centronics interface but this would be no problem to JOYCE users with a parallel port.(Do they need colour -Ed)

When characters and data are sent to the printer, it stores them away as dot positions in it's internal RAM. The upshot of this is that all the colours are printed on one pass and the print head does not have to go back over the line to do strikeouts and underlines. The only way in which the GP-700 scores over the Oki is the speed advantage this gives.

For the technically minded reader out there, and you have to be really, to take advantage of the colour option on this printer, the graphics can be done as 8-dot vertical graphics columns (out on the Arnold series as they don't have eight bits), as single dot units scanning horizontally as RGB data or single dot units scanning horizontally as the hammers on the print head would.

When printing in RGB mode, there is an option given which allows whites to be printed as black and vice versa. No truck with apartheid on this printer.

When printing lines of one colour though, Seikosha recommend using a special 2-pass mode 'because the ammount of ink transferred from an inker to ribbon is well suited to that sort of printing.'

Over-inking of the ribbon causes the ribbon to smear ink across the paper, even when the head is not printing there. This can be dealt with by moving the head away from the paper but the quality and intensity of the printout suffers. This showed up mostly on the screen dumps after I had tested the ordinary print quality in black and white by listing a slightly enormous assembler listing so I may be guilty of not retracting my inker. A heinous crime.

Inkers ? Ah yes, they are felt pen type objects that hide round the rim of the drum-magazine printer ribbon and re-ink it. Seikosha advise you to retract the colour inkers



when not in use to avoid overinking of the ribbon. The fabric of the ribbon does wear through, but if only one inker (say, red, if you are in a bank or suchlike) runs out, you can replace that inker on it's own. The snag is that you can only buy the inkers in sets.

The DIP switches used to set up the various options of the printer on start-up are, as is traditional with printers, well hidden inside the guts of the thing and require the use of screwdriver and heavy cutting gear etc. to get at them. Don't let that put you off, the default settings are quite acceptable and 99% of users will never need to change them in their lives.

A large example program in the back of the manual demonstrates to owners of an IBM how to fly the printer using BASIC. This shows you what type of market the product is aimed at and when the LPRINT's were replaced with PRINT#8's and irrelevant IBM jiggery-pokery was cut out, all the examples that didn't use the eighth bit worked perfectly.

The price is a bit steep at 331 quid without the ubiquitous Very Awful Tax, but it would probably prove cheaper to run than the Okimate 20. To sum up then, this is fine for churning out fast quantities of colour TEXT. Don't count on the quality of the colour graphics though.

ACU

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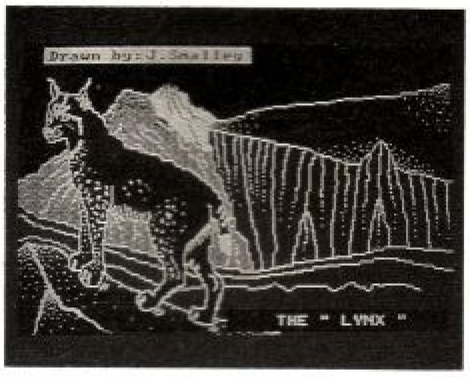
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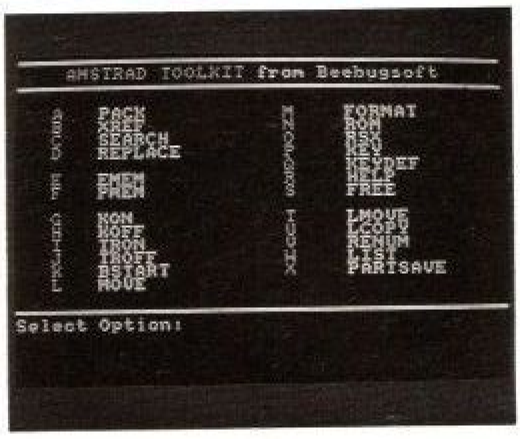
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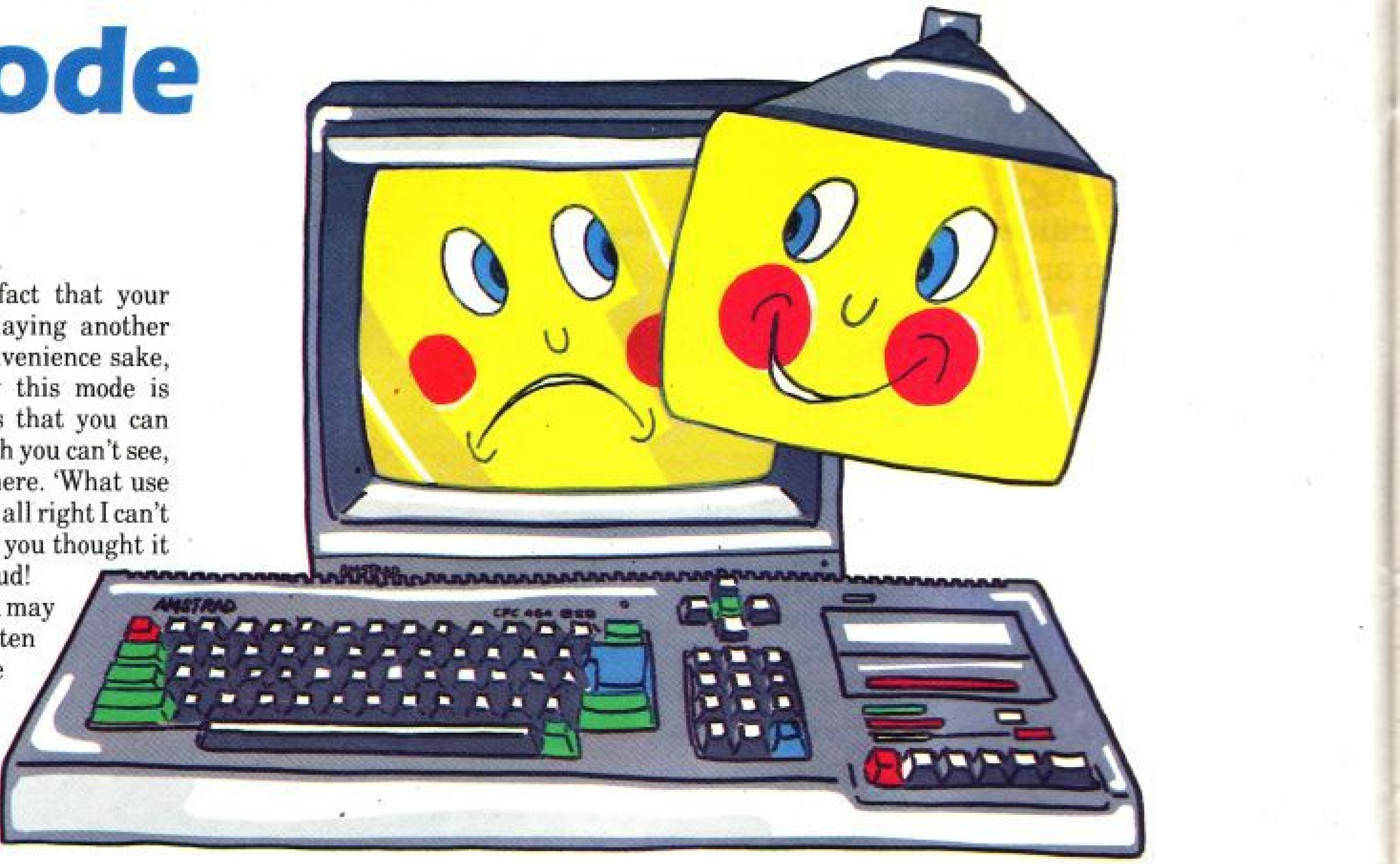
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BEEBUG SOFT

The Fourth Mode



Chris Wood reveals Mode 3

Yes, it is a little known fact that your Straddy is capable of displaying another mode on the screen. For convenience sake, let's call it 'Mode 3'. How this mode is different from the others is that you can have data on the screen which you can't see, but which is nevertheless there. 'What use is that?' I hear you ask. Well, all right I can't hear you but I'll bet some of you thought it even if you didn't say it out loud!

This is more useful than you may think. Suppose you have written a program that requires quite complicated instructions but you don't want them on the screen and you don't want to have to reprint them on the screen when you need them. Well, you can have them hidden, but still on the screen, and made visible when neccessary, making what was on the screen invisible in the process. You read your instructions then flip them back. What you have is, in effect, two screens in one. One which I will call the 'Front' screen and one which I will call the 'Back' screen. Games like Design Design's Tankbusters use this mode. All the work of erasing and redrawing all the scenery is done on the back screen where you can't see it, and then flipped to the front screen where you can, while the erasing and redrawing goes on what has now become the new back screen.

This mode does have its limitations. You can only have four colours, and the pixels are the same size as in Mode 0. That is you get twenty letters to the line. It is, however, great fun to use.

Luckily most of the normal Print commands can be used on it and some pens will draw on the Back screen, some on the front, some on both at the same time and some also on both, but in different colours on each.

The pens that write on the Front screen only are 1,2 and 3. The pens that write on the back screen only are 0,4,8 and 12. Pen 15 looks the same on both, and the remaining ones, 5,6,7,9,10,11,13 and 14 write on both but in different colours when viewed when the Front is in front and when the Back is in front.

If you type in and run the long program and run it, you will hopefully get the 'Ready' message and find that you have a few new commands. If you get an error message then you will be told which line to correct to make things run smoothly. The program will reserve itself some memory and then put itself above HIMEM out of the way, no matter where HIMEM is to start with. If you are using it with either my TRON program or my multicoloured RSX program -- from the last issue -- in memory you should page out the TRON program, and do 'POKE 0,1' before running this one. This is also true if you try to put the TRON program and 'multi' program in memory at the same time.

The new commands are;

|MODE which will put you into the new mode and will clear the screen just like any other Mode command.

|BACK. When you do a |MODE command you are initially looking at the Front screen, and to see the Back screen you do a |BACK command. If you have already done one then any others will be ignored.

|FRONT. Similarly enough, after a |BACK command to get back to the front screen you do a |FRONT command. Again more than one will be ignored until you do another |BACK command.

|CLRBACK. This command allows you to clear the part of the screen you can't see without affecting the front. It will clear what is at the back of the screen and not just the actual BACK screen itself. It will clear whichever one is not visible at the front.

|CLRFRONT. This will obviously enough clear the front of the screen, and not neccessarily the FRONT screen itself. You can quite easily do this;

|BACK:|CLRFRONT:|FRONT

This will bring the BACK screen into view, clear it and move it out of view again.

There is also a final command;

|PRINT. As I have said, most of the time the normal print routines can be used as you may have found out, if you have already typed in the program, but not when you print something in the front screen which is on top of something that is only visible on the back screen. For instance, if you did;

```
PEN 4:LOCATE 10,10:?"HELLO"
```

to print on the back screen, and also

```
PEN 1:LOCATE 10,10:?"GOODBYE"
```

which would appear on the front screen. When you did a |BACK command you would not find anything on the Back screen which has now come to the front. This final command allows you to do this.

It tries to do what the normal print routines do but without obliterating what is under it. I will explain later how it does it. To use it you simply put what you want printed into a string variable, and execute the routine, like this;

```
LET a$="HELLO":PEN 4:LOCATE 10,10:|PRINT,@a$
```

and also;

```
LET C$="GOODBYE":PEN 1:LOCATE 10,10:|PRINT,@C$
```

You can use any variable to put the text in, and if you use one which is empty you will get an error message. Now if you do your |BACK and |FRONT commands you will find the text intact on both screens. This will only work, though, if you use the pens that only write on one screen or the other and not both.

To erase only a part of the screen rather than all of it, you can use the normal method of printing SPACES where you need them. This will of course erase from both back and front screens. If you only want to erase from one or the other then simply re-printing the same letters over the ones you want erased using |PRINT will erase only those letters on that one screen, either front or back.

To recap and clarify all this front and back business. You have two screens, the one you see is always called the front, with a small 'f' and the one you can't is always called the back, with a small 'b'. You can flip between them for the |FRONT and |BACK commands, the one you see first after a |MODE command is called the Front, with a capital 'F' and similarly the other is called the Back. Apart from these commands, all the printing and clearing of screens takes place on the viewable front or back, the one you can see, or not, at the time of the command.

I will now do my best to explain how this mode works. A byte is made up of eight bits, and in Mode 0 four of these bits are used for the colour information for the left hand pixel on the screen and four for the left. e.g.

A Byte = 11111111

These are for the left pixel;

Left = 10101010

These are for the right pixel;

Right = 01010101

with four bits you can have 2 ↑ 4 or 16 colours in each pixel. Which is exactly what you have.

In Mode 3 the arrangement is different,

These are for the left pixel in the back screen;

Left Back = 00000011

These are for the left pixel in the front screen;

Left Front = 00001100

These are for the right pixel in the back screen;

Right Back = 00110000

Thse are for the right pixel in the front screen;

Right Front = 11000000

If we number the pixels like this

Bit Number 7,6,5,4,3,2,1,0

Byte 11111111

you can see that even if bits 7,6,5 and 4 were all set, only two of them, 7 and 6, would show on the front screen and bits 5 and 4, would illuminate the back screen. This is why you only have four colours because, for any screen, each pixel can only have 2 ↑ 2 or 4 different numbers.

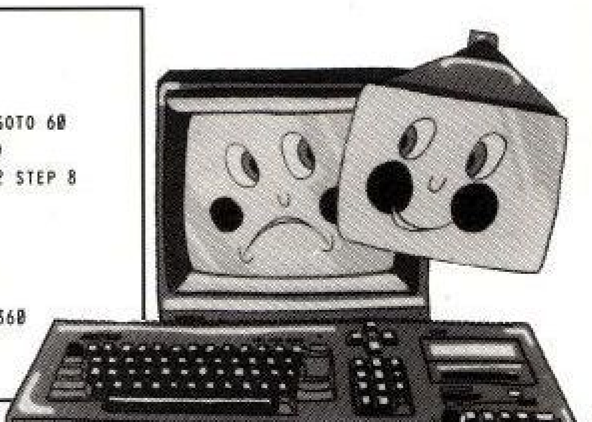
This is why printing over text on one screen will erase text on another if you use the normal methods. These use all four bits for each pixel even if only two are set, and erase the other two. |PRINT, however, XORs the text on so if only two bits are set on the back screen, and some text is put on the front screen then they combine and remain intact. The rule for XOR as I am sure most of you know is:

```
    1100         1111
XOR 0011     XOR 0011
    1111         1100
```

As you can see, in the first sum, the bits combine, and if you again try to XOR the same second number you get back what you started with. This is why |PRINTing the same thing twice will erase it. Of course if you |PRINT over something that appears on both screens at once like pen 15 you could end up with a mess, or you could find that it erases the text from one screen, but leaves it on the other.

Happy experimenting.

```
10 'Mode 3 RSX Driver Program.
20 'By Chris Wood.
30 '
40 h=HIMEM-1:IF PEEK(0)=0 THEN GOTO 60
50 POKE 0,0:h=h-312:MEMORY (h-1)
60 lin=1000:add=h:FOR t=1 TO 312 STEP 8
70 chk=0:FOR b=0 TO 7
80 READ a$:a$=UPPER$(a$):n=1
90 IF LEN(a$)<>2 THEN GOTO 360
100 b$=MID$(a$,n,1)
110 GOSUB 340:IF a=0 THEN GOTO 360
120 n=n+1:IF n=2 THEN GOTO 110
130 p=VAL("&"+a$):POKE add,p
140 add=add+1:chk=chk+p
150 NEXT b: READ a
160 IF a<>chk THEN GOTO 360
170 PRINT "Line";lin;"OK":lin=lin+10
180 NEXT t
190 r=h+9:a=INT(r/256):b=r-(a*256)
200 POKE h+1,b:POKE h+2,a
210 r=h+33:a=INT(r/256):b=r-(a*256)
220 POKE h+9,b:POKE h+10,a
230 r=h+29:a=INT(r/256):b=r-(a*256)
240 POKE h+4,b:POKE h+5,a
250 r=h+102:a=INT(r/256):b=r-(a*256)
260 POKE h+84,b:POKE h+85,a
270 r=h+308:a=INT(r/256):b=r-(a*256)
280 POKE h+203,b:POKE h+204,a
290 POKE h+210,b:POKE h+211,a
300 POKE h+230,b:POKE h+231,a
310 POKE h+237,b:POKE h+238,a
320 POKE h+271,b:POKE h+272,a
330 CALL h:END
340 a=INSTR("0123456789ABCDEF",b$)
350 RETURN
360 PRINT"ERROR in line";lin:END
1000 DATA 01,29,4E,21,3D,4E,C3,D1, 696
1010 DATA BC,41,4E,18,4F,00,18,4E, 536
1020 DATA 00,18,4D,00,18,4C,00,18, 225
1030 DATA 4B,00,18,27,00,00,00,00, 138
1040 DATA 00,46,52,4F,4E,D4,42,41, 652
1050 DATA 43,CB,4D,4F,44,C5,43,4C, 834
1060 DATA 52,46,52,4F,4E,D4,43,4C, 746
1070 DATA 52,42,41,43,CB,50,52,49, 718
1080 DATA 4E,D4,00,DD,6E,00,DD,66, 944
1090 DATA 01,7E,A7,C8,23,5E,23,56, 744
1100 DATA 47,C5,D5,CD,86,4E,D1,13, 1126
1110 DATA C1,10,F6,C9,18,6C,18,66, 914
1120 DATA 18,66,18,5E,18,5E,1A,CD, 593
1130 DATA A5,BB,11,AA,00,CD,53,BC, 1015
1140 DATA CD,93,BB,CD,2C,BC,4F,11, 1072
1150 DATA AA,00,06,20,1A,A1,12,13, 432
1160 DATA 10,FA,CD,78,BB,E5,25,2D, 1089
1170 DATA CD,1A,BC,D1,EB,D5,24,CD, 1317
1180 DATA 87,BB,EB,E1,C5,F5,E5,EB, 1688
1190 DATA CD,75,BB,E1,06,08,11,AA, 935
1200 DATA 00,C5,E5,06,04,1A,AE,77, 755
1210 DATA CD,20,BC,13,10,F7,E1,CD, 1137
1220 DATA 26,BC,C1,10,EC,F1,C1,D8, 1321
1230 DATA CD,69,BB,CD,99,BB,CD,50, 1327
1240 DATA BC,C9,18,4E,18,5D,18,1D, 661
1250 DATA 18,36,3A,A9,00,FE,63,C8, 858
1260 DATA 3D,32,A9,00,01,00,40,21, 378
1270 DATA 00,C0,7E,0F,0F,77,23,0B, 513
1280 DATA 78,B1,20,F6,C9,3A,A9,00, 1003
1290 DATA FE,64,C8,3C,32,A9,00,01, 834
1300 DATA 00,40,21,00,C0,7E,07,07, 429
1310 DATA 77,23,0B,78,B1,20,F6,C9, 941
1320 DATA AF,CD,0E,BC,F3,D9,79,F6, 1409
1330 DATA 03,4F,D9,FB,3E,63,32,A9, 930
1340 DATA 00,C9,01,00,40,21,00,C0, 491
1350 DATA 7E,E6,33,77,23,0B,78,B1, 869
1360 DATA 20,F6,C9,01,00,40,21,00, 577
1370 DATA C0,7E,E6,CC,77,23,0B,78, 1037
1380 DATA B1,20,F6,C9,00,00,00,00, 656
```



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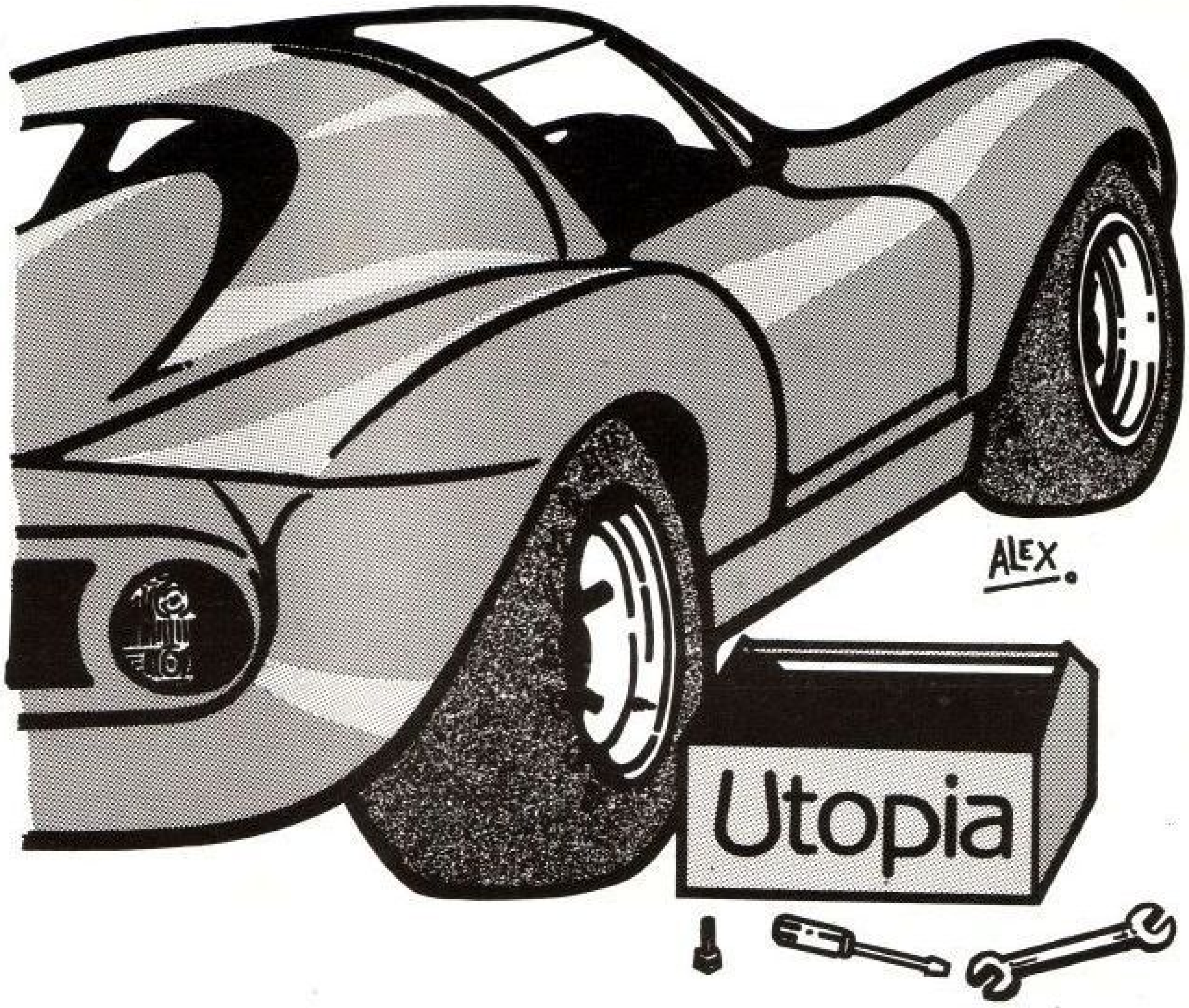
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Discs without CP/M



Vik Olliver reviews the latest ROM from Arnor

Arnor are really getting into add-on ROMs in a big way. This is their crack at a disc and general utilities ROM. It is a very quiet little thing and, unlike all my other ROMs, does not announce itself when the machine is reset. (Who will be the first to have so many ROMs that the screen scrolls on startup I wonder?).

The first thing I tried out was the help command. This shows all the ROMs on the system, together with their memory usage and whether they are foreground or background. An unusual feature is the new command |HELPR, which lists all your RSXs. The main idea though was to list the commands in UTOPIA. There are loads in there.

Some of the commands in there appear to duplicate Amsdos, like |ERA and |REN. Why? Because these commands now prompt you for the filenames if you leave them off and will be much appraised by 464 owners who are fed up with typing @A$ all the time. This is the general format for all the UTOPIA commands and as such is very user-friendly.

With all those commands in there, you are bound to have clashes with names and Arnor have two ways round this that avoid swapping all your ROMs around. Method one is a |U command which prompts you for a UTOPIA command. Method two is the command |X or |XROM, which lets you run a specified command in a particular ROM. Now all we need is for someone to create another XROM command.

One of the ideas of this ROM seems to be to dispense with the need to go into CP/M for normal, sane people (unlike me) or pure machine code hackers. One of the ways this is made easier is with a disc format command that formats either drive to data or CP/M vendor format. There is no real CP/M format as this would mean Arnor having a copy of CP/M in their ROM, which would soon result in Digital Research dissassembling Arnor.

For looking at files on tape or disc, there is a suite of commands; |LIST, |TYPE & |DUMP. Type displays a file (very useful if you want to look at a file while editing the main program). |LIST does the same thing but gives you line numbers. The dump command is very close to the CP/M plus command and shows a listing of the file in hex , with the ASCII characters alongside it.

If the integrity of a disc is in doubt, there is a disc checking utility to search for bad sectors, tracks, traces of cat fur and holes etc.

Their disc copy routine works fine, (with one or two drives, it's not fussy) so backups are possible without dirtying fingers with CP/M.

The filecopy routine is the most frequently used one in my books. This one works fine on one or two drives, and like the CP/M version, wipes the current user memory. It has no problems.

One of the crafty bits in it is the disc editor. This is not for use by novices because simple tinkering can give any disc the ability to give the Amstrad disc operating system a real headache. The only place this fell down was trying to read the last sector on a JOYCE disc, but only idiots and reviewers put JOYCE discs in an Arnold. This utility was very useful for re-instating VAX on the high score table of my Sorcery disc (I was displaced by a fluke anyway ...).

Bulk Delete

If you want to delete a lot of files from a disc, the delete command alows you to earmark a group and wipe the lot when you are sure you have the right group. I can see this routine preventing many a tear being shed due to over-enthusiastic (and unintentional) disc housecleaning.

A really useful utility is the I INFO command which tells all about the files on your disc. Hackers take note : there is also a utility to make files read/write or system/directory without delving into CP/M.

Hackers may also be interested in Arnor's version of the call routine. This allows you to pass parameters to a routine in all the main registers (not IX or IY, the first one is set by a normal call and you should never alter the second one anyway). When it returns, it displays all the registers in the state the routine left them in. Useful for trying out firmware routines before incorporating them in the program and crashing it.

Values to be passed to the routines can now be worked out as unsigned hex. or binary using the Utopia C command. To those uninitiated in the black art of machine code hacking, the Basic tends to convert every hexadecimal (look it up in the manual) number bigger that 32,768 to a negative number. Utopia doesn't.

Other helpful hacking accessories are the I LOAD, I SAVE & I MEDIT commands which let you load ANY file off disc, hack the memory about and put it back with different load and run addresses. The I MEDIT command has an added bonus for 6128 users, it allows editing of the extra banks of memory.

So far, I have only mentioned some useful disc routines. Do not get the idea UTOPIA is all disc hacking, because there are many Basic utilities in there.

At this point I must say that the Amsoft technical department look down their noses sideways at certain parts of the ROM. They are not pleased with the liberties Arnor are taking with the Basic. The point is though, that they work on all the machines so far, and work well.

Beefier Basic

The sort of thing that I find handy in Basic is the "list all the variables" command (it works on arrays too). This is also useful when you forget what the heck you called a variable. No matter, these lapses of memory are normal for us techies. In case we forget what functions we create, there is a routine to list those too. Unfortunately, it does not tell you what they do. But then the programmer can't always tell you either ....

A slightly dodgy feature is the one to find and replace a tokenised Basic string in a program. This can fall over quite catastrophically when one of your line numbers is replaced by another string. This is the sort of routine that can teach you to make frequent backups.

One unusual but harmless feature concerns the command to move chunks of Basic around a program. It moves the lines, but does not renumber. With skill, it is possible to write (and run) programs with the line numbers going backwards. Confusing, but the Basic's RENUMBER command kicks them all into line.

The printer has not been ignored in all the chaos, there are now a few routines to stop the need of POKEs into the printer jumpblocks (if this talk is above you, maybe you need this ROM).

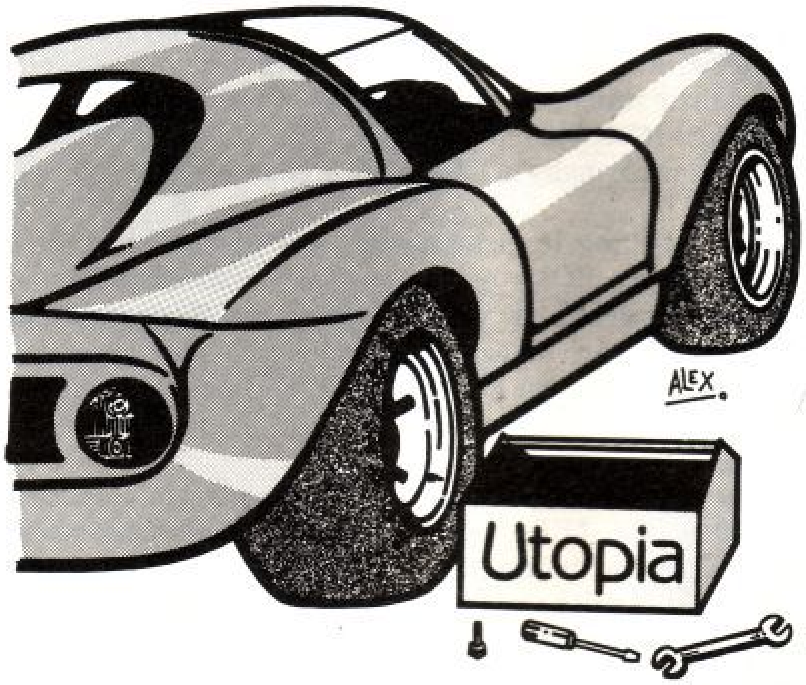
Spooling of stuff intended for the printer to a file is now a doddle, as is de-spooling (turning it off, for the Campaign for Simple English). To check what is going to the spool file, there is a command to echo all printer stuff to the screen.

What else do we have on an Arnold ? Oh yes, a keyboard. This has also been got at by the A - Team and now produces RUN"DISC when the [CTRL][ENTER] keys are hit.

The function keys are set up to a variety of useful strings to fire up Protext, Maxam and other utilities. One neat string is the one that resets the screen colours and mode, very useful for when you run one of those programs that crashes while printing everything out in a window two characters wide in black on dark black.

Another command is there to show you what all the expansion strings are set up to. They think of everything don't they?

This ROM contains a lot of useful utilities. Useful to the programmer that is. In this respect it is more realistic than most 'Toolbox' ROMs which assume every machine will be fitted with one. Whether you think all this convenience is worth thirty quid or not is a matter of individual taste. Some people like hacking about and others see no point in re-inventing the wheel. If you are not a wheel-inventor, get Utopia.



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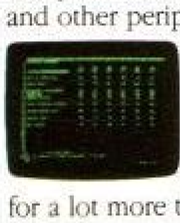
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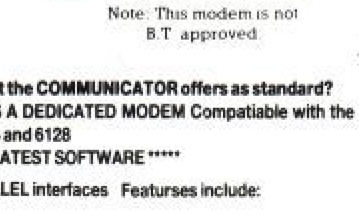
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PAK CAVERNS

Pak Caverns is a game of strategy and skill, it involves guiding your muncher through ten lethal caverns eating apples and avoiding dangerous objects. Full playing instructions are included in the loader program.

The game is designed to be fun, addictive and not require any great speed from BASIC. Machine code routines have been kept to a minimum.

Due to the length of the program it has been split into two sections, one of which loads after the other. The first program to load contains instructions, graphics and machine code. This is just over 13K in length. After the program is completed the next program on tape automatically loads. This is the main game and is about 35K in length.

Note that all references to the fire button refer to the button on the joystick or the large enter key on the keyboard. I have been as devious as possible in designing the various levels and although some of the levels are extremely difficult to complete I assure you that all are possible. Practice makes perfect.

Typing Instructions:

Type in the first loader program and when it is working correctly, save it using SAVE 'PAK CAVERNS'
Now type in the second program and when that is working correctly, save it using SAVE 'PAKMAIN'

IMPORTANT NOTE:

It is necessary to have had the loader program running before the main program as it uses routines that are set up by the loader program.

MAIN PROGRAM:

10-90	Initialise.
100-200	Begin new game.
210-480	Main loop.
490-670	Practice mode level selector.
680-700	Laser interrupt subroutine 1.
710-730	Laser interrupt subroutine 2.
740-830	Practice mode or start game selection.
840-1170	Play drum roll.
1180-1240	Define sound envelopes.
1250-1540	Set up title screen tune arrays.
1550-1580	Set up high score arrays.
1590-1920	Display title screen.
1930-2050	Demonstration routine.
2060-2430	Play title screen tune.
2440-2480	Print mess$ in double height at cursor position.
2490-2510	Blank top section of screen.
2520-2570	Pause routine.
2580-2620	Lose a life routine.
2630-2670	Game over routine.
2680-2820	Level completion bonus routine.
2830-2910	Practice mode continue or exit?
2920-2960	Free life routine.
2970-3020	Mystery bonus routine.
3030-4990	Level printing subroutines.
5000-5150	Mega-bonus routine.
5160-5430	Play Game Over routine.
5440-5780	Enter high scorers name.
5790-5830	Display high scores.
5840-6130	Play high score tune.
6140-6150	Draw fancy border.
6160-6200	Data for demonstration.

```
10 ' ************************************
20 ' *    PAK CAVERNS LOADER PROGRAM    *
30 ' *      BY CRAIG MITCHELL 1985      *
40 ' ************************************
50 MODE 1:BORDER 0:INK 0,0:INK 1,26:INK
   2,6,3:INK 3,8,4:SPEED INK 20,20
60 LOCATE 15,12:PEN 3:PAPER 0:PRINT"PLEA
   SE  WAIT":LOCATE 13,24:PEN 2:PRINT"DO
    NOT STOP TAPE"
70 GOSUB 400:GOSUB 810
80 sl=h+189:sr=h+231:ad=HIMEM+140
90 POKE sl+1,128:POKE sl+2,199:POKE sr+1
   ,48:POKE sr+2,199
100 a$="          INSTRUCTIONS (Y/N) ?
         "
110 a=31:b=10:PEN 1:PAPER 0
120 FOR f=1 TO 30:POKE ad+5,ASC(MID$(a$,
    a,1)):CALL ad:LOCATE 1,24:PRINT CHR$
    (254);:POKE ad+5,ASC(MID$(a$,b,1)):C
    ALL ad:LOCATE 40,25:PRINT CHR$(255);
130 CALL sr:CALL sl:a=a-1:b=b+1:NEXT
140 FOR f=1 TO 12:LOCATE 1,25:PRINT CHR$
    (10):NEXT
150 FOR f=-450 TO 640 STEP 32:MOVE f,0:D
    RAWR 400,400,1:MOVE 639-f,0:DRAWR -4
    00,400:NEXT:WINDOW 10,31,11,14:CLS:W
    INDOW 1,40,1,25:LOCATE 11,12:mess$="
    INSTRUCTIONS (Y/N) ?":GOSUB 2510
160 INK 2,1:INK 3,0:FOR f=0 TO 16 STEP 2
    :MOVE f,f:DRAW 639-f,f,((f/2) MOD 2)
    +2:DRAW 639-f,399-f:DRAW f,399-f:DRA
    W f,f:NEXT
170 EVERY 5 GOSUB 500:i=2:c=2
180 WHILE k$<>"n" AND k$<>"y":PEN i:i=i+
    1:IF i=4 THEN i=2
190 LOCATE 9,10:PRINT CHR$(210):FOR f=10
     TO 31:LOCATE f,10:PRINT CHR$(143):N
    EXT:LOCATE 32,10:PRINT CHR$(211)
200 FOR f=11 TO 14:LOCATE 32,f:PRINT CHR
    $(143):NEXT:LOCATE 32,15:PRINT CHR$(
    208):FOR f=31 TO 10 STEP -1:LOCATE f
    ,15:PRINT CHR$(143):NEXT:LOCATE 9,15
    :PRINT CHR$(209):FOR f=14 TO 11 STEP
     -1:LOCATE 9,f:PRINT CHR$(143):NEXT
210 INK 1,c:c=c+1:IF c=25 THEN c=1
220 k$=LOWER$(INKEY$):WEND
230 FOR f=128 TO 320 STEP 2:MOVE f,160:D
    RAWR 0,100,0:MOVE 639-f,160:DRAWR 0,
    100:NEXT
240 IF k$="y" THEN GOSUB 1750
250 re=REMAIN(0):SOUND 135,0,0,1
260 CLS:BORDER 6:INK 0,6:INK 2,2:INK 3,0
270 c1=3:c2=1:x=3:y=4:m$="PROGRAM AND DE
    SIGN BY CRAIG MITCHELL":GOSUB 340
280 x=2:y=6:m$="MAPLE LEAF RAG ARRANGED
    BY C.MITCHELL.":GOSUB 340
290 c1=1:c2=2:x=4:y=9:m$="ENOLA GAY AND
    OTHER TUNES ARRANGED":GOSUB 340
300 x=14:y=11:m$="BY PETER YOUNG":GOSUB
    340
310 x=2:y=15:c1=2:c2=1:m$="PAK CAVERNS I
    S NOW LOADING.PLEASE WAIT":GOSUB 340
320 x=5:y=17:c1=1:c2=3:m$="LOADING TIME
    IS APPROX 8 MINUTES":GOSUB 340
330 RUN"pakmain"
340 PRINT CHR$(23)CHR$(3);:TAG
350 xp=((x-1)*16)-2:yp=((26-y)*16):PLOT
    800,800,c1
360 FOR f=yp TO yp-4 STEP -2:FOR g=xp TO
     xp+4 STEP 2:MOVE g,f:PRINT m$;:NEXT
     g,f
370 TAGOFF
380 PRINT CHR$(23)CHR$(0)CHR$(22)CHR$(1)
    ;
390 LOCATE x,y:PEN c2:PRINT m$;CHR$(22)C
    HR$(0):RETURN
400 tempo=9:ENV 1,15,-1,10
410 DIM a(219,1),b(138,1),c(86,1):RESTOR
    E 540
420 f=0
430 READ n,d:IF n<>-1 THEN a(f,0)=n:a(f,
    1)=d*tempo:f=f+1:GOTO 430
440 f=0
450 READ n,d:IF n<>-1 THEN b(f,0)=n:b(f,
    1)=d*tempo:f=f+1:GOTO 450
460 f=0
470 READ n,d:IF n<>-1 THEN c(f,0)=n:c(f,
    1)=d*tempo:f=f+1:GOTO 470
480 note1=0:note2=0:note3=0
490 RETURN
500 IF NOT SQ(1) AND 1 THEN SOUND 1,a(no
    te1,0),a(note1,1),ABS(a(note1,0)<>0)
    *15,ABS(a(note1,0)<>0)::note1=note1+
    1:IF note1=220 THEN note1=0:note2=0:
    note3=0:SOUND 135,0,0,1
510 IF NOT SQ(2) AND 1 THEN SOUND 2,b(no
    te2,0),b(note2,1),ABS(b(note2,0)<>0)
    *15,ABS(b(note2,0)<>0)::note2=note2+
    1
520 IF NOT SQ(4) AND 1 THEN SOUND 4,c(no
    te3,0),c(note3,1),ABS(c(note3,0)<>0)
    *15,ABS(c(note3,0)<>0):note3=note3+1
530 RETURN
540 DATA 119,4,119,4,119,4,119,4,119,2,1
    59,2,142,2,190,2,159,2,142,6,239,2,2
    13,2,201,2,239,2,213,2,190,2,239,2,2
    13,2,190,2,239,2,213,4,239,4,190,2,1
    59,2
550 DATA 119,4,119,4,119,4,119,4,119,2,1
    59,2,142,2,190,2,159,2,142,6,239,2,2
    13,2,201,2,239,2,213,2,190,2,239,2,2
    13,2,190,2,239,2,213,4,239,10
560 DATA 127,2,80,2,127,2,106,2,84,4,127
    ,2,89,2,127,2,106,2,95,4,159,2,106,2
    ,159,4,190,2,119,2,190,2,159,2,142,4
    ,190,2,119,2,190,2,159,2,142,4,190,2
    ,142,6
570 DATA 159,2,127,2,213,2,179,2,142,4,1
    59,2,127,2,213,2,179,2,142,4,179,2,1
    42,6,190,2,119,2,190,2,159,2,142,4,1
    90,2,119,2,190,2,159,2,142,4,190,2,1
    42,6,127,2,80,2,127,2,106,2,84,4,127
    ,2
580 DATA 89,2,127,2,106,2,95,4,159,2,106
    ,2,159,4,190,2,119,2,190,2,159,2,142
    ,4,190,2,119,4,119,4,127,4,134,6,284
    ,2,225,2,190,2,142,2,190,2,239,2,284
    ,4,284,2,213,2,179,2,142,4,179,4,190
    ,4,190,6,213,4,319,4
590 DATA 239,2,190,2,159,2,119,8,119,4,1
    42,4,119,4,142,4,119,4,106,2,95,4,10
    6,2,119,2,142,2,159,2,142,4,190,12,1
    59,2,142,2,190,2,159,2,142,4,190,2,1
    59,4,142,2,213,12
600 DATA 179,2,142,2,213,2,179,2,142,4,1
    90,4,159,2,142,2,190,2,159,2,142,4,1
    90,4,159,2,142,2,190,2,159,2,142,4,1
    59,2,119,4,142,4,119,4,142,4,119,4,1
    06,2,95,4,106,2,119,2,142,2
610 DATA 119,4,142,4,159,2,119,4,190,4,1
    59,2,142,2,190,2,159,2,142,4,239,4,2
    13,2,239,4,239,4,213,2,239,4,213,2,1
    90,2,239,2,213,2,190,4,239,4,213,2,1
    90,2,239,4,213,4,319,2,239,2,159,2,1
    19,40
620 DATA -1,-1
630 DATA 201,4,201,4,201,4,201,4,190,4,3
    19,4,638,4,319,4,536,4,338,4,638,4,3
    19,4,284,4,253,4,379,8
640 DATA 201,4,201,4,201,4,201,4,190,4,3
    19,4,638,4,319,4,536,4,338,4,638,4,3
    19,4,284,4,253,4,379,8
650 DATA 426,4,179,4,638,4,179,4,426,4,1
    79,4,638,4,506,4,478,4,319,4,638,4,3
    19,4,478,4,319,4,478,4,451,4
660 DATA 426,4,253,4,638,4,253,4,426,4,2
    53,4,426,4,402,4,379,4,239,4,638,4,3
    19,4,478,4,319,4,478,4,451,4,426,4,1
    79,4,638,4,179,4
670 DATA 426,4,179,4,638,4,253,4,478,4,3
    19,4,638,4,319,4,239,4,239,4,253,4,2
    68,4,568,8,451,8,426,8,358,8,239,8,2
    53,4,638,4
680 DATA 478,8,478,8,142,4,179,4,142,4,1
    79,4,142,16,190,6,239,30,253,12
690 DATA 426,4,253,4,638,4,506,4,478,4,3
    19,4,638,4,319,4,478,4,319,4,426,4,3
    79,4,142,4,179,4,142,4,179,4,142,4,2
    84,4,426,4,402,4
700 DATA 159,4,190,4,190,8,478,4,319,4,6
    38,4,319,4,284,4,358,4,602,4,338,4,6
    38,4,319,4,638,4,602,4,568,4,358,4,6
    38,4,358,4,379,2,638,2,159,40
710 DATA -1,-1
720 DATA 338,16,638,4,379,8,379,8,402,8,
    379,4,506,4,358,4,478,8
730 DATA 338,16,638,4,379,8,379,8,402,8,
    379,4,379,4,358,4,478,12
740 DATA 253,8,253,8,253,16,379,8,379,8,
    379,16
750 DATA 319,8,319,8,319,16,319,8,379,8,
    379,16,253,8,253,8
760 DATA 253,16,379,8,379,4,478,4,478,4,
    506,4,536,4,1136,8,902,8,851,8,716,8
    ,338,8,319,24
770 DATA 358,4,284,4,284,4,478,4,358,4,2
    84,4,426,4,402,4,379,4,319,4,319,4,6
    38,4,478,4,319,4,638,4,451,4,426,4,3
    58,4,638,4,451,8
780 DATA 379,16,379,8,379,8,379,12,358,4
    ,284,4,284,4,478,4,358,16
790 DATA 379,4,319,4,319,4,638,8,379,8,3
    79,8,478,8,478,8,379,16,426,16,956,4
    0
800 DATA -1,-1
810 IF PEEK(HIMEM+1)<>&21 THEN SYMBOL AF
    TER 32:MEMORY HIMEM-280:h=HIMEM+1:ad
    dr=h:tot=0:RESTORE 810 ELSE h=HIMEM+
    1:RETURN
820 FOR f=0 TO 274:READ byte$:byte=VAL("
    &"+byte$):POKE addr,byte:addr=addr+1
    :tot=tot+byte:NEXT f
830 IF tot<>27725 THEN CLS:PRINT CHR$(7)
    "CHECKSUM ERROR.":MEMORY HIMEM+280:E
    ND
840 CALL h
850 SYMBOL 48,124,102,206,246,198,204,12
    0,0
860 SYMBOL 49,24,120,24,24,24,24,126,0
870 SYMBOL 50,124,198,102,12,48,102,252,
    0
880 SYMBOL 51,124,198,6,60,6,198,124,0
890 SYMBOL 52,6,14,30,54,127,6,6,12
900 SYMBOL 53,254,198,192,124,6,198,124,
    0
910 SYMBOL 54,124,230,96,124,198,198,124
    ,0
920 SYMBOL 55,126,198,12,126,24,48,96,96
930 SYMBOL 56,124,230,102,124,198,198,12
    4,0
940 SYMBOL 57,124,230,102,62,6,204,120,0
950 SYMBOL 65,48,120,236,254,198,198,102
    ,6
960 SYMBOL 66,124,230,102,252,198,198,12
    4,0
970 SYMBOL 67,60,102,204,192,192,198,124
    ,0
980 SYMBOL 68,124,246,102,102,102,204,24
    8,0
990 SYMBOL 69,60,102,192,248,192,198,124
    ,0
1000 SYMBOL 70,60,102,96,120,96,96,192,1
     92
1010 SYMBOL 71,60,102,96,204,198,102,62,
     6
1020 SYMBOL 72,230,102,102,126,102,198,2
     06,192
1030 SYMBOL 73,124,216,24,24,48,48,120,0
1040 SYMBOL 74,126,198,6,12,12,24,216,11
     2
1050 SYMBOL 75,230,102,108,120,108,102,2
     30,6
1060 SYMBOL 76,48,240,48,96,96,198,252,0
1070 SYMBOL 77,195,231,127,107,99,99,103
     ,192
1080 SYMBOL 78,230,102,118,126,110,102,1
     02,192
1090 SYMBOL 79,124,102,198,198,198,204,1
     20,0
1100 SYMBOL 80,248,108,102,124,96,96,96,
     192
1110 SYMBOL 81,124,102,198,198,222,204,1
     26,6
1120 SYMBOL 82,124,230,108,120,120,108,1
     02,192
1130 SYMBOL 83,62,99,198,112,28,198,124,
     0
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1140 SYMBOL 84,126,216,24,24,24,24,24,48
1150 SYMBOL 85,102,230,102,102,198,198,1
     24,0
1160 SYMBOL 86,108,230,102,102,54,60,24,
     0
1170 SYMBOL 87,99,227,99,107,127,119,99,
     112
1180 SYMBOL 88,204,102,60,24,60,102,204,
     0
1190 SYMBOL 89,102,230,102,60,12,24,48,2
     24
1200 SYMBOL 90,126,198,12,24,48,102,254,
     0
1210 SYMBOL 227,60,126,255,255,255,255,1
     26,60
1220 SYMBOL 230,62,111,248,224,224,248,1
     27,62
1230 SYMBOL 231,124,246,31,7,7,31,254,12
     4
1240 SYMBOL 232,66,195,195,231,167,255,1
     26,60
1250 SYMBOL 233,60,126,255,229,231,195,1
     95,66
1260 SYMBOL 234,60,126,239,255,240,255,1
     26,60
1270 SYMBOL 235,60,126,247,255,15,255,12
     6,60
1280 SYMBOL 236,52,118,247,247,223,255,1
     26,60
1290 SYMBOL 237,60,126,255,251,239,239,1
     10,44
1300 SYMBOL 238,60,255,62,89,82,72,36,8
1310 SYMBOL 239,0,60,255,62,89,82,72,36
1320 SYMBOL 240,0,0,60,255,62,89,82,72
1330 SYMBOL 241,0,0,0,60,255,62,89,82
1340 SYMBOL 242,0,0,0,0,60,255,62,89
1350 SYMBOL 243,0,0,0,0,0,60,255,62
1360 SYMBOL 244,0,0,0,0,0,0,60,255
1370 SYMBOL 245,0,0,0,0,0,0,0,60
1380 SYMBOL 246,238,0,187,0,238,0,187
1390 SYMBOL 247,68,40,148,81,57,166,88,1
     6
1400 SYMBOL 248,255,127,62,30,28,12,8,8
1410 SYMBOL 249,255,255,220,206,102,36,1
     12,216
1420 SYMBOL 250,4,8,60,78,94,126,60,0
1430 SYMBOL 251,255,255,102,204,153,51,1
     02,255
1440 SYMBOL 252,100,148,148,148,148,148,
     148,99
1450 SYMBOL 253,95,68,68,68,68,68,68,132
     :SYMBOL 208,255,255,254,254,252,248
     ,240,192:SYMBOL 209,255,255,127,127
     ,63,31,15,3:SYMBOL 210,3,15,31,63,1
     27,127,255,255:SYMBOL 211,192,240,2
     48,252,254,254,255,255
1460 RETURN
1470 DATA 21,e1,e9,22,30,00,f7,eb
1480 DATA 21,77,00,19,4e,23,46,79
1490 DATA b0,28,15,e5,60,69,19,e5
1500 DATA 4e,23,46,60,69,19,44,4d
1510 DATA e1,71,23,70,e1,23,18,e4
1520 DATA 01,2a,00,21,66,00,c3,d1
1530 DATA bc,2f,00,c3,37,00,47,45
1540 DATA 54,43,48,41,d2,00,fe,02
1550 DATA 20,1e,dd,6e,02,dd,66,03
1560 DATA e5,dd,46,00,0e,00,c5,cd
1570 DATA b7,bb,c1,cd,60,bb,e1,77
1580 DATA 9f,3c,23,77,cd,b7,bb,c9
1590 DATA 21,6a,00,7e,23,cd,5a,bb
1600 DATA fe,0a,20,f7,c9,00,00,00
1610 DATA 00,42,61,64,20,43,61,6d
1620 DATA 6d,61,6e,64,0d,0a,22,00
1630 DATA 25,00,2a,00,2d,00,5a,00
1640 DATA 00,00,00
1650 DATA cd,06,b9,f5,3e,00,cd,a5,bb,dd,
     21,32
1660 DATA 90,06,08,7e,dd,77,00,dd,77,01,
     23,dd,23,dd
1670 DATA 23,10,f2,f1,cd,0c,b9,3e,fe,21,
     32,90,cd
1680 DATA a8,bb,3e,ff,21,3a,90,cd,a8,bb,
     c9
1690 DATA 21,80,c7,06,08,cd,19,bd,f3,c5,
     e5,56,23,5e,d5
1700 DATA 23,06,4e,7e,2b,2b,77,23,23,23,
     10,f7,2b,d1,73,2b
1710 DATA 72,e1,01,00,08,09,c1,10,e1,fb,
     c9
1720 DATA 21,80,c7,01,41,00,09,06,08,cd,
     19,bd,f3,c5,e5,56
1730 DATA 2b,5e,2b,d5,06,4e,7e,23,23,77,
     2b,2b,2b,10,f7,d1,23,73,23,72,e1
1740 DATA 01,00,08,09,c1,10,e1,fb,c9
1750 BORDER 3:INK 0,3:INK 1,18:INK 2,15:
     INK 3,24:PAPER 0:MODE 1
1760 PEN 3:mess$="P A K  C A V E R N S":
     LOCATE 11,1:GOSUB 2510:PEN 1:LOCATE
     10,3:PRINT STRING$(22,154)
1770 LOCATE 1,6:PEN 2:PRINT"GUIDE FRED F
     ODDISH [";:PEN 3:PRINT CHR$(230);:P
     EN 2:PRINT"] THROUGH 10 LETHAL"
1780 PRINT"CAVERNS, COLLECTING APPLES ["
     ;:PEN 1:PRINT CHR$(250);:PEN 2:PRIN
     T"] AND THEN"
1790 PRINT:PRINT"ESCAPING THROUGH THE GA
     TEWAY [ "CHR$(252)CHR$(253)" ] INTO
     "
1800 PRINT"THE NEXT CAVERN."
1810 PRINT:PEN 1:PRINT TAB(17)STRING$(8,
     154)
1820 PEN 3:PRINT:PRINT"YOU CAN ONLY PASS
     THROUGH THE GATEWAY":PRINT:PRINT"W
     HEN IT IS FLASHING. IT ONLY FLASHES
     "
1830 PRINT:PRINT"WHEN A CERTAIN NUMBER O
     F APPLES HAVE":PRINT:PRINT"BEEN EAT
     EN."
1840 GOSUB 2450
1850 CLS:INK 1,6:INK 2,26:INK 3,2
1860 PEN 3:PRINT"AT THE START OF EACH SC
     REEN YOU HAVE AN":PRINT:PRINT"ENERG
     Y LEVEL OF 100%. EVERY TIME YOU HIT
     "
1870 PRINT"EITHER A WALL [";:PAPER 2:PEN
     1:PRINT STRING$(5,246);:PEN 3:PAPE
     R 0:PRINT"] , A GIRDER [";:PEN 2:PR
     INT STRING$(5,251);:PEN 3:PRINT"]"
1880 PRINT"A FLOOR [";:PEN 1:PRINT STRIN
     G$(5,249);:PEN 3:PRINT"] OR PART OR
     YOUR TRAIL"
1890 PRINT:PRINT"[";:PEN 2:PRINT STRING$
     (5,227);:PEN 3:PRINT"] YOUR ENERGY
     DROPS BY 10%."
1900 PRINT:PRINT"ALLOWING YOUR ENERGY LE
     VEL TO REACH 0%":PRINT:PRINT"LOSES
     YOU A LIFE."
1910 PEN 1:PRINT:PRINT TAB(17)STRING$(8,
     154)
1920 PEN 2:PRINT:PRINT"THERE ARE ALSO PO
     ISONOUS OBJECTS WHICH":PRINT:PRINT"
     ARE INSTANTLY FATAL, THESE ARE KILL
     ING"
1930 PRINT:PRINT"BUSHES [";:PEN 3:PRINT
     CHR$(247);:PEN 2:PRINT"] AND VENOMO
     US SPIKES [";:PEN 1:PRINT CHR$(248)
     ;:PEN 2:PRINT"]."
1940 PRINT:PRINT"AVOID THESE AT ALL COST
     S !!"
1950 GOSUB 2450
1960 CLS:INK 1,16:INK 2,11:INK 3,18,3:SP
     EED INK 20,60
1970 PEN 1:PRINT"COLLAPSING FLOORS [
     ] MAY ALSO BLOCK"
1980 PEN 2:LOCATE 20,1:PRINT STRING$(5,2
     38):PEN 1
1990 PRINT:PRINT"YOUR PATH BUT YOU CAN E
     AT THROUGH THESE,":PRINT"HOWEVER IN
     DOING SO SOME ENERGY IS LOST."
2000 PEN 3:PRINT:PRINT TAB(17)STRING$(8,
     154):PEN 2
2010 PRINT:PRINT"LASER BEAMS MAY ALSO FI
     RE AT REGULAR"
2020 PRINT:PRINT"INTERVALS, DO NOT ENTER
     THE BEAMS WHEN"
2030 PRINT:PRINT"THEY ARE FIRING."
2040 PEN 3:PRINT:PRINT:PRINT TAB(11)STRI
     NG$(20,154):FOR f=18 TO 22:LOCATE 3
     1,f:PRINT CHR$(149):NEXT
2050 PEN 1:LOCATE 31,17:PRINT CHR$(246):
     LOCATE 10,17:PRINT CHR$(246):LOCATE
     31,23:PRINT CHR$(246)
2060 PEN 1:LOCATE 16,20:mess$="LASER BEA
     MS":GOSUB 2510
2070 GOSUB 2450
2080 CLS:INK 1,13:INK 2,19:INK 3,7
2090 LOCATE 17,1:PEN 2:mess$="SCORING:":
     GOSUB 2510
2100 PEN 1:LOCATE 16,3:PRINT STRING$(10,
     154)
2110 PRINT:PEN 3:mess$="APPLES
     : 10 POINTS":GOSUB 2510:PRINT
2120 PRINT:mess$="FLASHING APPLES : 50 P
     OINTS":GOSUB 2510
2130 PRINT:PRINT:PRINT:PEN 1:mess$="LEVE
     L BONUS=LEVEL NO. x ENERGY REMAININ
     G":GOSUB 2510
2140 PRINT:PRINT:PEN 2:mess$="MEGA-BONUS
     =5000 POINTS ON COMPLETION OF":GOSU
     B 2510:PRINT:PRINT:mess$="LEVEL TEN
     .":GOSUB 2510
2150 PEN 1:PRINT:PRINT:PRINT:mess$="BONU
     S LIFE AT 5000 POINTS, THEN EVERY":
     GOSUB 2510:PRINT:PRINT:mess$="10000
     POINTS AFTER THAT.":GOSUB 2510
2160 PEN 3:PRINT:PRINT:PRINT:PRINT TAB(1
     2)"MYSTERY BONUS = ??"
2170 GOSUB 2450
2180 CLS:INK 1,8:INK 2,26:INK 3,24
2190 PEN 2:LOCATE 16,1:mess$="CONTROLS :
     ":GOSUB 2510
2200 PEN 1:LOCATE 6,5:PRINT"JOYSTICK":PE
     N 3:LOCATE 24,5:PRINT"KEYBOARD"
2210 PRINT:PEN 1:PRINT TAB(9)"UP":PRINT:
     PRINT TAB(8)"DOWN":PRINT:PRINT TAB(
     8)"LEFT":PRINT:PRINT TAB(8)"RIGHT":
     PRINT:PRINT TAB(8)"FIRE"
2220 PEN 3:LOCATE 27,7:PRINT"P":LOCATE 2
     7,9:PRINT"L":LOCATE 27,11:PRINT"Z":
     LOCATE 27,13:PRINT"X":LOCATE 25,15:
     PRINT"ENTER"
2230 PEN 2:FOR f=7 TO 15 STEP 2:LOCATE 1
     8,f:PRINT"====":NEXT
2240 LOCATE 1,19:PEN 1
2250 PRINT"PRESSING FIRE PAUSES THE GAME
      UNTIL     IT IS PRESSED AGAIN."
2260 PEN 3:PRINT:PRINT"CTRL & TAB RESTAR
     T THE GAME."
2270 GOSUB 2450
2280 CLS:INK 1,23:INK 2,14:INK 3,2
2290 LOCATE 14,1:PEN 3:mess$="PRACTICE M
     ODE:":GOSUB 2510:PEN 1:LOCATE 13,3:
     PRINT STRING$(16,154)
2300 PRINT:PEN 2:PRINT"IN PRACTICE MODE
     YOU CAN CHOOSE TO START":PRINT"ON A
     NY OF THE 10 LEVELS, HOWEVER YOU DO
     "
2310 PRINT:PRINT"NOT RECEIVE ANY LEVEL B
     ONUSES, FREE":PRINT:PRINT"LIVES, MY
     STERY BONUSES OR THE MEGA-BONUS":PR
     INT"FOR COMPLETING LEVEL 10."
2320 PRINT:PEN 3:PRINT"IF YOU SUCCESSFUL
     LY COMPLETE A SCREEN":PRINT:PRINT"Y
     OU ARE GIVEN THE CHOICE OF CONTINUI
     NG"
2330 PRINT:PRINT"ON THE NEXT LEVEL OR EX
     ITING PRACTICE":PRINT:PRINT"MODE. I
     F YOU CONTINUE YOU GET 3 LIVES":PRI
     NT:PRINT"AND YOUR SCORE IS RESET."
2340 GOSUB 2450
2350 CLS
2360 PEN 1:PRINT"IF YOU LOSE ALL 3 LIVES
      YOU ARE GIVEN":PRINT:PRINT"THE SAM
     E 2 CHOICES AS BEFORE EXCEPT THAT"
2370 PRINT"CONTINUING RESTARTS YOU ON TH
     E SAME":PRINT:PRINT"LEVEL AS BEFORE
     ."
2380 LOCATE 18,9:mess$="HINTS:":PEN 2:GO
     SUB 2510:PEN 1:LOCATE 17,11:PRINT S
     TRING$(8,154)
2390 PEN 3:PRINT:PRINT"* PLAN YOUR ROUTE
      CAREFULLY AND BE":PRINT"  CAREFUL
     NOT TO TRAP YOURSELF OR ANY":PRINT"
       APPLES IN WITH YOUR TRAIL."
2400 PRINT:PRINT"* KEEP AN EYE ON YOUR E
     NERGY LEVEL,":PRINT"  REMEMBER, EAT
     ING THROUGH COLLAPSING":PRINT"  FLO
     ORS REQUIRES ENERGY."
2410 PRINT:PRINT"* ANTICIPATE THE FIRING
      OF THE LASERS.":PRINT:PRINT"* PRAC
     TICE !!"
2420 GOSUB 2450
2430 CLS
2440 RETURN
2450 PEN 1:LOCATE 9,25:PRINT STRING$(24,
     238):a$="PRESS SPACE TO CONTINUE.":
     FOR f=1 TO 1000:NEXT
2460 FOR f=1 TO 24:PEN 1:FOR g=238 TO 24
     5:LOCATE f+8,25:PRINT CHR$(g):NEXT
     g:LOCATE f+8,25:PEN 2
2470 PRINT MID$(a$,f,1):NEXT f
2480 WHILE INKEY$<>"":WEND
2490 WHILE INKEY$<>" ":WEND
2500 RETURN
2510 ad=HIMEM+140:FOR i=1 TO LEN(mess$)
2520 POKE ad+5,ASC(MID$(mess$,i,1)):CALL
     ad
2530 PRINT CHR$(254)CHR$(10)CHR$(8)CHR$(
     255)CHR$(11);
2540 NEXT i
2550 RETURN
```

Main Program

```
10 '*************************************
20 '*   PAK CAVERNS,GAME & DESIGN BY    *
30 '*   CRAIG MITCHELL . APPROX. 34K    *
40 '*************************************
50 DEFINT a-z:RANDOMIZE TIME:KEY DEF 74,
   0,122,122,122:KEY DEF 75,0,120,120,12
   0:KEY DEF 72,0,112,112,112:KEY DEF 73
   ,0,108,108,108:KEY DEF 76,0,13,13,13
60 KEY 139,CHR$(13)+"paper 0:pen 1:ink 0
   ,13:ink 1,0:border 13:mode 2:speed ke
   y 30,1:list"+CHR$(13):SPEED KEY 255,2
   55
70 PRINT CHR$(23)CHR$(0)CHR$(22)CHR$(0);
80 GOSUB 1180:GOSUB 6160
90 GOTO 1590
100 BORDER 0:FOR f=0 TO 15:INK f,0:NEXT:
   level=1:sc=0:men=3:MODE 0:WINDOW 1,2
   0,1,20:WINDOW #1,1,20,21,25:b=0:BORD
   ER 0:CLS:apsc=10:freeman=5000:mo=0:p
   a=1
110 FOR f=0 TO 15:INK f,0:NEXT:PAPER #1,
   0:PAPER 5:CLS:CLS#1:PEN#1,1:mess$="S
   CORE:":LOCATE #1,2,1:WINDOW SWAP 0,1
   :GOSUB 2440:LOCATE 2,4:mess$="MEN:":
   GOSUB 2440:LOCATE 12,4:mess$="LEVEL":
   :GOSUB 2440
120 IF prac THEN PEN 5:LOCATE 4,3:PRINT"
   PRACTICE  MODE"
130 IF demo THEN PEN 5:LOCATE 4,3:PEN 5:
   PRINT"SPACE TO START"
140 PEN 9:mess$=CHR$(230)+" "+CHR$(230)+
   " "+CHR$(230):LOCATE 6,4:GOSUB 2440:
   LOCATE 15,1:PEN 1:PRINT"ENERGY";
150 IF demo THEN mess$="DEMO.":LOCATE 6,
   4:PEN 9:GOSUB 2440
160 WINDOW SWAP 0,1
170 INK 9,6:INK 0,6:INK 1,20:INK 2,22
180 IF prac THEN level=praclev
190 PLOT 800,800,2:TAGOFF#1:eaten=0:WIND
   OW SWAP 0,1:PEN 2:LOCATE 17,4:mess$=
   STR$(level):GOSUB 2440:PEN 9:LOCATE
   20,2:mess$="%":GOSUB 2440:WINDOW SWA
   P 1,0:PEN #1,2:LOCATE #1,16,2:PRINT#
   1," 100"
200 SPEED INK 15,15
210 SOUND 135,0,1,0
220 IF prac THEN level=praclev:IF level=
   11 THEN level=1:praclev=1:LOCATE #1,
   17,4:PRINT#1,"   ":LOCATE #1,17,5:PR
   INT#1,"   ";:GOTO 190
230 energy=100:ON level GOSUB 3030,3180,
   3360,3500,3710,3840,4060,4290,4560,4
   770,5000:IF level=11 THEN level=1:GO
   TO 190
240 x=sx:y=sy
250 xd=0:yd=0:ate=0:low=0
260 frame=0:WHILE INKEY$<>"":WEND
270 IF lasers=1 THEN lc1=0:lc2=1:AFTER l
   on1 GOSUB 680:AFTER lon2,1 GOSUB 710
280 FOR f=1 TO 40:NEXT f:k1$=LOWER$(INKE
   Y$):IF k1$=CHR$(13) AND demo=0 THEN
   GOSUB 2520
290 SOUND 2,150+low,10,15,0,2
300 IF INKEY(68)=128 THEN re=REMAIN(0):r
   e=REMAIN(1):GOTO 1590
310 IF demo THEN pa=pa-1:IF pa=0 THEN pa
   =m(mo):k1$=m$(mo):mo=mo+1
320 IF demo AND k1$=" " THEN 740
330 IF k1$="p" THEN xd=0:yd=-1:pac=232
340 IF k1$="l" THEN xd=0:yd=1:pac=233
350 IF k1$="z" THEN xd=-1:yd=0:pac=231
360 IF k1$="x" THEN xd=1:yd=0:pac=230
370 hit=0:hit1=0:ox=x:oy=y:x=x+xd:y=y+yd
   :LOCATE x,y:|GETCHAR,@hit,0:PAPER 14
   :|GETCHAR,@hit1,0:PAPER 5
380 IF hit=247 OR hit=248 THEN 2580
390 IF hit=154 AND lc1=1 THEN 2580
400 IF hit=149 AND lc2=1 THEN 2580
410 IF hit=250 THEN SOUND 4,50,-1,10,3,3
   :ate=ate+1:sc=sc+apsc:TAG#1:MOVE 226
   ,70:PRINT#1,sc;:TAGOFF#1:IF ate=appl
   es THEN INK 15,26,8:eaten=1:SOUND 1,
   10,-1,15,3,4:INK 7,af1,af2:apsc=apsc
   *5
420 low=0:IF hit1=246 OR hit=227 OR hit=
   249 OR hit=251 OR ((hit=252 OR hit=2
   53) AND eaten=0) OR (hit>211 AND hit
   <216) OR hit=143 THEN x=ox:y=oy:ener
   gy=energy-10:LOCATE #1,16,2:PRINT#1,
   energy:low=50:IF energy<=0 THEN 2580
430 IF (hit=253 OR hit=252) AND eaten=1
   THEN 2680
440 IF hit>237 AND hit<246 THEN energy=e
   nergy-2:LOCATE #1,16,2:PRINT#1,energ
   y:IF energy<=0 THEN 2580
450 IF hit>237 AND hit<246 THEN c=hit+1:
   IF c=246 THEN c=32
460 IF hit>237 AND hit<246 THEN LOCATE x
   ,y:PEN 10:PRINT CHR$(c):x=ox:y=oy:lo
   w=50
470 LOCATE ox,oy:PEN 2:PRINT CHR$(227):L
   OCATE x,y:PEN 9:PRINT CHR$(frame+pac
   ):frame=frame+4:IF frame=8 THEN fram
   e=0
480 GOTO 280
490 BORDER 10:INK 0,10:INK 1,2:INK 2,7:I
   NK 3,26:INK 4,6:INK 5,18:INK 6,0:PAP
   ER 0:INK 7,15:INK 8,26:INK 9,20:INK
   10,7,17:MODE 0
500 PAPER 1:WINDOW 2,18,1,7:CLS:PAPER 2:
   WINDOW 2,19,10,14:CLS:WINDOW 8,14,15
   ,18:CLS:WINDOW 1,20,1,25
510 PAPER 0:PEN 6:LOCATE 3,8:PRINT STRIN
   G$(16,207):FOR f=2 TO 8:LOCATE 19,f:
   PRINT CHR$(219):NEXT
520 PEN 6:LOCATE 3,15:PRINT STRING$(5,20
   7):LOCATE 9,19:PRINT STRING$(6,207):
   LOCATE 15,15:PRINT STRING$(5,207)
530 FOR f=11 TO 15:LOCATE 20,f:PRINT CHR
   $(219):NEXT:FOR f=16 TO 19:LOCATE 15
   ,f:PRINT CHR$(219):NEXT
540 PEN 3:PAPER 1:mess$="PRACTICE MODE":
   LOCATE 4,2:GOSUB 2440
550 mess$="LEVEL  SELECTOR":LOCATE 3,5:G
   OSUB 2440
560 PEN 5:PAPER 2:LOCATE 3,11:PRINT"USE
   LEFT & RIGHT":LOCATE 3,12:PRINT"TO
   SELECT LEVEL":LOCATE 3,13:PRINT"THEN
    PRESS  FIRE"
570 PEN 10:PAPER 2:LOCATE 8,16:mess$=">"
   :GOSUB 2440:LOCATE 14,16:mess$="<":G
   OSUB 2440
580 MOVE 32,399:DRAWR 540,0,7:DRAWR 0,-1
   10:DRAWR -540,0:DRAWR 0,110
590 MOVE 32,254:DRAWR 574,0,8:DRAWR 0,-7
   8:DRAWR -160,0:DRAWR 0,-64:DRAWR -22
   0,0:DRAWR 0,64:DRAWR -192,0:DRAWR 0,
   78
```

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```
600 praclev=1:prac=1
610 PEN 9:LOCATE 11,16:mess$="1":GOSUB 2440
620 k$=LOWER$(INKEY$):IF k$<>"z" AND k$<>"x" AND k$<>CHR$(13) THEN 620
630 IF k$="z" THEN praclev=praclev-1:IF praclev=0 THEN praclev=10
640 IF k$="x" THEN praclev=praclev+1:IF praclev=11 THEN praclev=1
650 IF k$=CHR$(13) THEN 100
660 LOCATE 10,16:mess$=STR$(praclev)+" ":GOSUB 2440
670 GOTO 620
680 lc1=lc1+1:IF lc1=2 THEN lc1=0
690 IF lc1=0 THEN INK 3,b:AFTER loff1 GOSUB 680 ELSE INK 3,link:AFTER lon1 GOSUB 680
700 RETURN
710 lc2=lc2+1:IF lc2=2 THEN lc2=0
720 IF lc2=0 THEN INK 4,b:AFTER loff2,1 GOSUB 710 ELSE INK 4,link:AFTER lon2,1 GOSUB 710
730 RETURN
740 BORDER 0:INK 0,0:INK 1,1:INK 2,18:INK 3,11:PAPER 0:MODE 1:demo=0
750 WINDOW 11,29,6,12:PAPER 1:CLS:WINDOW 10,30,16,19:CLS
760 WINDOW 1,40,1,25
770 PEN 1:PAPER 0:LOCATE 12,13:PRINT STRING$(19,207):LOCATE 11,20:PRINT STRING$(21,207)
780 FOR f=7 TO 12:LOCATE 30,f:PRINT CHR$(207):NEXT:FOR f=17 TO 19:LOCATE 31,f:PRINT CHR$(207):NEXT
790 PAPER 1:PEN 2:mess$="1 - PRACTICE MODE":LOCATE 12,7:GOSUB 2440
800 mess$="2 - START GAME":LOCATE 12,10:GOSUB 2440
810 PEN 3:mess$="PLEASE PRESS 1 OR 2":LOCATE 11,17:GOSUB 2440
820 MOVE 160,318:DRAWR 302,0,3:DRAWR 0,-110:DRAWR -302,0:DRAWR 0,110
830 MOVE 144,158:DRAWR 334,0,2:DRAWR 0,-62:DRAWR -334,0:DRAWR 0,62
840 SOUND 135,0,1,0
850 s=1
860 FOR t=1 TO 4
870 IF s>2 THEN s=1
880 IF s=1 THEN ch=1
890 IF s=2 THEN ch=4
900 FOR y=1 TO 3
910 FOR o=0 TO 200:NEXT o
920 ton=(t+4)*54
930 GOSUB 1150:ON k GOTO 490,100
940 SOUND ch,ton,6,0,6,5,1
950 NEXT
960 s=s+1:NEXT:ch=5:s=1
970 FOR t=0 TO 180:NEXT
980 GOSUB 1150:ON k GOTO 490,100
990 SOUND 2,0,150,15,7,0,1
1000 FOR p=1 TO 3
1010 SOUND ch,486,6,15,6,5,1
1020 FOR t=0 TO 720:NEXT
1030 SOUND ch,300,6,0,6,7,1
1040 FOR t=0 TO 360:NEXT
1050 SOUND ch,300,6,0,6,7,1
1060 FOR t=0 TO 360:NEXT
1070 SOUND ch,486,6,15,6,7,1
1080 FOR t=0 TO 720:NEXT
1090 SOUND ch,300,6,0,6,7,1
1100 GOSUB 1150:ON k GOTO 490,100
1110 IF p<3 THEN FOR t=0 TO 720:NEXT
1120 SOUND 2,150,10,15,4,2:IF p=3 THEN FOR t=0 TO 480:NEXT
1130 NEXT p
1140 GOTO 860
1150 k$=INKEY$:IF k$<>"1" AND k$<>"2"THEN k=0:RETURN
1160 IF k$="1"THEN k=1 ELSE k=2
1170 RETURN
1180 RESTORE 1180:ENV 1,5,1,3,15,-1,10
1190 ENV 2,5,1,1,15,-1,4
1200 ENV 3,5,1,1,3,-1,5
1210 ENV 4,15,-1,2:ENT -1,10,-1,1,10,1,1:ENT 2,80,-8,1:ENT -3,5,-3,1,5,3,1:ENV 5,10,0,10,10,-1,20:ENT -4,10,5,1,1,-40,1
1220 ENT -5,1,-127,1,5,24,1:ENV 6,1,15,1,5,-3,2:ENV 7,15,-1,10
1230 ENV 8,5,1,1,15,-1,1:ENV 9,5,1,2,15,-1,2:ENV 10,5,1,1,15,-1,2:ENV 11,5,1,10,15,-1,15
1240 ENV 12,5,1,1,15,-1,50:ENV 13,5,1,1,15,-1,10
```

```
1250 DIM a1(88),b1(88),c1(88),d1(88),e1(32)
1260 DIM b(64),c(64),d(64),e(64),f(64),g(64)
1270 FOR a=1 TO 64:READ b(a),c(a):NEXT a
1280 DATA 71,40,67,20,71,100,0,0,0,0,0,0,0,0,0,0
1290 DATA 89,20,0,0,71,20,67,20,60,20,67,20,71,60,0,0
1300 DATA 71,40,80,40,106,80,0,0,0,0,0,0,0,0,0,0
```

```
1310 DATA 71,40,0,0,80,40,0,0,89,60,0,0,0,0,0,0
1320 DATA 67,40,71,40,89,100,0,0,0,0,0,0,0,0,0,0
1330 DATA 89,20,80,20,71,20,80,20,89,60,0,0,0,0,0,0
1340 DATA 80,40,71,40,80,260,0,0,0,0,0,0,0,0,0,0
1350 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
1360 FOR a=1 TO 64:READ d(a):NEXT a
1370 DATA 45,53,45,47,45,53,45,47,45,53,45,47,45,53,40,47
1380 DATA 45,53,45,47,45,53,45,47,45,53,45,47,45,53,40,47
1390 DATA 45,53,45,47,45,53,45,47,45,53,45,47,45,53,40,47
1400 DATA 45,53,45,47,45,53,45,47,45,53,45,47,45,53,40,47
1410 FOR a=1 TO 64:READ e(a):NEXT a
1420 DATA 358,358,358,358,358,358,358,358,358,358,358,358,358,358,358,379
1430 DATA 426,426,426,426,426,426,426,426,426,426,426,426,426,426,426,478
1440 DATA 536,536,536,536,536,536,536,536,536,536,536,536,536,536,536,426
```

```
1450 DATA 478,478,478,478,478,478,478,478,478,478,478,478,478,478,478,478
1460 FOR a=1 TO 64:READ f(a),g(a):NEXT a
1470 DATA 89,40,71,20,67,20,60,20,67,20,71,40,0,0,0,0
1480 DATA 89,20,89,20,71,20,67,20,60,20,67,20,71,40,0,0
1490 DATA 106,40,89,20,80,20,71,20,80,20,89,60,0,0,0,0
1500 DATA 106,20,106,20,71,20,71,20,80,40,89,40,0,0,0,0
1510 DATA 134,40,106,20,100,20,89,20,100,20,106,40,0,0,0,0
1520 DATA 134,20,134,20,106,20,100,20,89,20,100,20,106,40,0,0
1530 DATA 119,40,95,20,89,20,80,20,89,20,95,40,0,0,0,0
1540 DATA 119,20,119,20,80,20,80,20,89,40,95,40,0,0,0,0
1550 DIM hi$(9),hi(9)
1560 FOR f=0 TO 9:READ hi$(f):hi(f)=(11-(f+1))*1000:NEXT
```

```
1570 RETURN
1580 DATA ** MITCH **,STU,FOD,MATT'S CLUMSY LIFE,THE MASTER IS DEAD,LOPPO,JEFF MINTER RULES O.K,DON'T BUG ME,GO HOME AGG,FAT WALLET
1590 INK 0,6:INK 1,24:INK 2,1:INK 3,26:BORDER 6:MODE 1
1600 DEFSTR q-z:v=CHR$(208):u=CHR$(32):w=CHR$(209):x=CHR$(210):y=CHR$(211):z=CHR$(143):q=CHR$(212):r=CHR$(213):s=CHR$(214):t=CHR$(215)
1610 PEN 1:PAPER 0
1620 LOCATE 13,7:PRINT z;z;u;u;u;u;z;z;u;u;z;u;z;z;r;z;t
1630 LOCATE 13,2:PRINT x;z;z;z;y;u;x;z;z;z;y;u;x;z;u;s;z
1640 LOCATE 13,5:PRINT z;z;z;z;v;u;z;z;z;z;z;u;z;z;z
1650 LOCATE 13,3:PRINT z;z;z;z;z;u;z;z;z;z;z;u;z;z;s;z;q
1660 LOCATE 13,6:PRINT z;z;u;u;u;u;z;z;u;u;z;u;z;z;z;t
1670 LOCATE 13,4:PRINT z;z;u;u;z;u;z;z;u;u;z;u;z;z;z;q
1680 LOCATE 13,8:PRINT z;z;u;u;u;u;z;z;u;u;z;u;z;z;u;r;z
1690 PEN 3:LOCATE 1,17:PRINT z;z;z;z;z;u;z;z;z;u;u;z;u;r;z;z;z;z;q;u;z;z;z;z;z;z;u;z;z;r;z;t;u;z;z;u;z;u;z;z;z;z;z;z
1700 LOCATE 1,12:PRINT x;z;z;z;y;u;x;z;z;z;z;y;u;x;z;u;u;y;u;x;z;z;z;z;z;u;x;z;z;z;z;y;u;x;z;z;y;u;x;z;z;z;y
1710 LOCATE 1,15:PRINT z;z;u;u;u;u;z;z;z;z;z;u;z;z;u;u;z;u;z;z;z;z;z;u;u;z;z;z;z;v;u;z;z;u;z;u;w;z;z;z;y
1720 LOCATE 1,13:PRINT z;z;z;z;z;u;z;z;z;z;z;z;u;z;z;u;z;u;z;z;z;z;z;z;u;z;z;z;z;z;u;z;z;z;z;z;u;z;z;z;z;z;z
1730 LOCATE 1,16:PRINT z;z;u;u;z;u;z;z;u;u;z;u;z;z;t;s;z;u;z;z;u;u;u;z;z;z;t;u;u;z;z;u;z;u;u;u;u;u;z
1740 LOCATE 1,14:PRINT z;z;u;u;z;u;z;z;u;u;z;u;z;z;u;u;z;u;z;z;u;u;u;u;z;z;u;u;z;u;z;z;u;z;u;z;z
1750 LOCATE 1,18:PRINT w;z;z;z;v;u;z;z;u;u;z;u;u;r;z;z;q;u;u;w;z;z;z;z;z;u;z;z;u;r;z;u;z;z;z;u;z;u;w;z;z;z;v
1760 FOR f=272 TO 330 STEP 4:MOVE 100,f:DRAWR 400,0,0:NEXT
1770 FOR f=100 TO 170 STEP 4:MOVE 0,f:DRAWR 640,0,0:NEXT:PAPER 2:WINDOW 1,10,1,9:CLS:WINDOW 31,39,1,9:CLS:WINDOW 1,39,20,24:CLS:WINDOW 1,40,1,25:DEFINT a-z
1780 PAPER 0:PEN 2
```

```
1790 LOCATE 2,10:PRINT STRING$(10,207):LOCATE 32,10:PRINT STRING$(9,207):LOCATE 2,25:PRINT STRING$(39,207);:FOR f=21 TO 24:LOCATE 40,f:PRINT CHR$(207);:NEXT
1800 FOR f=2 TO 10:LOCATE 11,f:PRINT CHR$(207):LOCATE 40,f:PRINT CHR$(207):NEXT
1810 PAPER 2
1820 PEN 3:LOCATE 2,2:mess$="PROGRAM":GOSUB 2440:LOCATE 5,5:PRINT"BY":LOCATE 1,7:mess$="C.MITCHELL":GOSUB 2440
1830 LOCATE 33,2:mess$="MUSIC":GOSUB 2440:LOCATE 35,5:PRINT"BY":LOCATE 32,7:mess$="P.YOUNG":GOSUB 2440
1840 LOCATE 11,20:mess$="PRESS SPACE TO START":GOSUB 2440
```

```
1850 LOCATE 9,23:mess$="W A I T  F O R  D E M O.":GOSUB 2440
1860 MOVE 0,399:DRAWR 158,0,1:DRAWR 0,-144:DRAWR -158,0:DRAWR 0,144
1870 MOVE 479,399:DRAWR 144,0:DRAWR 0,-144:DRAWR -144,0:DRAWR 0,144
1880 MOVE 0,96:DRAWR 622,0:DRAWR 0,-80:DRAWR -622,0:DRAWR 0,80
1890 EVERY 20 GOSUB 2410
1900 prac=0
1910 k=2:demo=0:GOSUB 2060:re=REMAIN(0):IF demo=1 THEN 1930
1920 SOUND 135,0,1,0:GOTO 740
1930 BORDER 0:FOR f=0 TO 15:INK f,0:NEXT:MODE 0:b=0
1940 WINDOW 1,20,1,20:WINDOW #1,1,20,21,25
1950 PAPER 5:CLS:PAPER #1,0:CLS#1
1960 WINDOW SWAP 0,1:PEN 1:mess$="DEMONSTRATION":LOCATE 5,1:GOSUB 2440
1970 PEN 2:mess$="SPACE TO START.":LOCATE 4,4:GOSUB 2440
1980 WINDOW SWAP 0,1:LOCATE #1,1,1:PEN #1,9:PRINT#1,"LEV."
1990 SPEED INK 20,20:INK 0,6:INK 1,14:INK 2,26:INK 9,24
2000 FOR l=1 TO 10:ON l GOSUB 3030,3180,3360,3500,3710,3840,4060,4290,4560,4770,5000
2010 PEN #1,9:LOCATE #1,1,2:PRINT#1,l
2020 IF lasers=1 THEN INK 3,link,b:INK 4,b,link
2030 FOR f=1 TO 1000:k$=LOWER$(INKEY$)
2040 IF k$=" " THEN 740 ELSE NEXT f:CLS:NEXT l
2050 demo=1:GOTO 100
2060 GOSUB 2160:GOSUB 2230:GOSUB 2160:GOSUB 2230:GOSUB 2160:GOSUB 2290:GOSUB 2160:GOSUB 2350
2070 SOUND 2,478,20,10,3
2080 SOUND 2,478,20,10,3
2090 SOUND 2,536,20,10,3
2100 SOUND 2,536,20,10,3
```

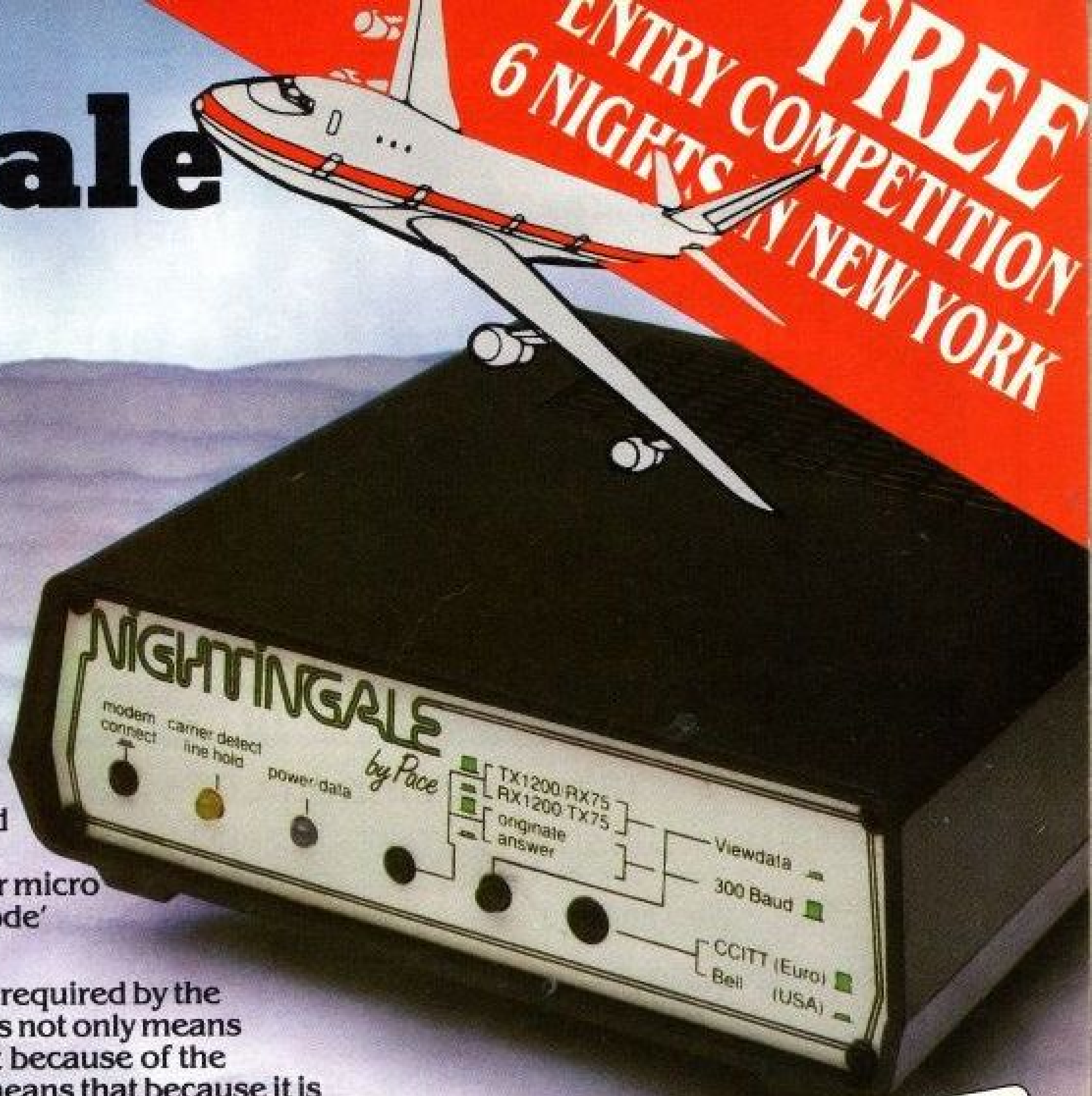
```
2110 SOUND 2,568,20,10,3:SOUND 2,568,20,10,3
2120 SOUND 2,638,20,10,3
2130 demo=1
2140 SOUND 2,716,320,10,1
2150 RETURN
2160 SOUND 1,0,1280
2170 FOR a=1 TO 64
2180 SOUND 4,D(A),20,10,2
2190 SOUND 2,E(A),20,10,3
2200 IF k<>2 THEN 1920
2210 NEXT
2220 RETURN
2230 FOR a=1 TO 64:IF F(a)<>0 THEN SOUND 1,F(a),G(a),10,1
2240 SOUND 4,D(A),20,10,2
2250 SOUND 2,E(A),20,10,3
2260 IF k<>2 THEN 1920
2270 NEXT A
2280 RETURN
2290 FOR a=1 TO 64:IF b(a)<>0 THEN SOUND 1,b(a),c(a),10,1
2300 SOUND 4,D(A),20,10,2
2310 SOUND 2,E(A),20,10,3
2320 IF k<>2 THEN 1920
2330 NEXT
2340 RETURN
2350 FOR a=1 TO 51:IF b(a)<>0 THEN SOUND 1,b(a),c(a),10,1
2360 SOUND 4,D(A),20,10,2
2370 SOUND 2,E(A),20,10,3
2380 IF k<>2 THEN 1920
2390 NEXT
2400 RETURN
2410 k$=LOWER$(INKEY$):IF k$=""THEN RETURN
2420 IF k$=" " THEN re=REMAIN(0):k=0:RETURN
2430 RETURN
2440 ad!=HIMEM+140:FOR i=1 TO LEN(mess$)
2450 POKE ad!+5,ASC(MID$(mess$,i,1)):CALL ad!
2460 PRINT CHR$(254)CHR$(10)CHR$(8)CHR$(255)CHR$(11);
2470 NEXT i
2480 RETURN
```

```
2490 FOR f=3 TO 8:INK f,b:NEXT
2500 FOR f=10 TO 15:INK f,b:NEXT
2510 RETURN
2520 DI:WINDOW SWAP 0,1:SOUND 135,100,10,5:SOUND 7,150,10,5:PEN 9:LOCATE 1,4:mess$="  PAUSED  ":GOSUB 2440
2530 k$=INKEY$:IF k$<>CHR$(13) THEN 2530
2540 PEN 1:LOCATE 1,4:mess$=" MEN:     ":GOSUB 2440:mess$=CHR$(230):PEN 9:FOR f=1 TO men:LOCATE f*2+4,4:GOSUB 2440:NEXT f
2550 PEN 2:WINDOW SWAP 0,1:SOUND 7,100,10,5:SOUND 7,150,10,5:FOR f=1 TO 800:NEXT f:SOUND 135,0,1,0
2560 EI
2570 RETURN
2580 CALL &BCA7:re=REMAIN(0):re=REMAIN(1):SOUND 2,200,-1,15,5,2,20:SPEED INK 1,1
2590 LOCATE x,y:PEN 2:PRINT CHR$(227):LOCATE ox,oy:PRINT CHR$(227)
2600 SOUND 5,300,-1,10,1:apsc=10
2610 FOR f=1 TO 25:FOR g=64 TO 91:BORDER f:OUT &7F00,5:OUT &7F00,g:OUT &7F00,16:OUT &7F00,g:NEXT g,f:BORDER b
2620 a=4+(men*2):LOCATE #1,a,4:PRINT#1,"  ":LOCATE #1,a,5:PRINT#1,"  ":men=men-1:IF men<>0 THEN CLS:GOTO 190
2630 IF prac THEN 2830
2640 PAPER 5:CLS:WINDOW 6,17,9,14:PAPER 6:CLS:WINDOW 5,16,8,13:PAPER 7:CLS:WINDOW 1,20,1,20
2650 PEN 15:INK 5,0:BORDER 0
2660 INK 15,6,26:INK 6,1:INK 7,2:SPEED INK 10,20:LOCATE 6,10:mess$="GAME  OVER":GOSUB 2440
2670 GOTO 3160
2680 apsc=10:re=REMAIN(0):re=REMAIN(1):IF prac THEN 2830
2690 a=80:FOR f=320 TO 0 STEP -4:MOVE f,80:DRAWR 0,310,5:MOVE 640-f,80:DRAWR 0,310:MOVE 0,a:DRAWR 640,0:MOVE 0,480-a:DRAWR 640,0:a=a+2:SOUND 2,f+10,5,7:NEXT:IF demo THEN 1590
```

```
2700 PAPER 14:PEN 13
2710 FOR f=1 TO 10:LOCATE f,7:PRINT CHR$(246):LOCATE 21-f,7:PRINT CHR$(246);:LOCATE f,12:PRINT CHR$(246):LOCATE 21-f,12:PRINT CHR$(246);:NEXT
2720 FOR f=8 TO 11:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246);:NEXT
2730 a$="   BONUS:"+STR$(energy)+" X"+STR$(level)+"       ":frame=230
2740 mess$=CHR$(230)
2750 PAPER 5:FOR f=2 TO 19:LOCATE f,9:PEN 9:mess$=CHR$(frame):SOUND 7,150,10,15,0,2:GOSUB 2440:FOR g=1 TO 200:NEXT g:LOCATE f,9:mess$=MID$(a$,f,1):PEN 1:GOSUB 2440:frame=frame+4:IF frame=238 THEN frame=230
2760 NEXT f
2770 a$="TOTAL ="+STR$(energy*level):a=LEN(a$):LOCATE (20-a)/2+1,14:PEN 0:PRINT STRING$(a,238)
2780 c=1:FOR f=(20-a)/2+1 TO (20-a)/2+a:SOUND 1,f+20,-1,15,4,1:SOUND 4,f+40,-1,15,4,1:PEN 0:FOR g=238 TO 245:LOCATE f,14:PRINT CHR$(g):FOR i=1 TO 50:NEXT i,g:LOCATE f,14:PEN 2:PRINT MID$(a$,c,1):c=c+1:NEXT f
2790 TAG#1:PLOT 800,800,2:a=20:FOR f!=1 TO energy*level STEP (energy*level)/50:MOVE 226,70:PRINT#1,CINT(f!+sc);:SOUND 1,a,10,15,0,1:a=a+2:SOUND 4,a+10,10,15,0,1:NEXT
2800 sc=sc+(energy*level):MOVE 226,70:PRINT#1,sc;
2810 TAGOFF#1
2820 level=level+1:IF sc>=freeman THEN 2920 ELSE CLS:GOTO 190
2830 CLS:WINDOW 4,18,2,5:PAPER 14:CLS:WINDOW 1,20,1,20:PEN 13:mess$="PRACTICE MODE":LOCATE 5,3:GOSUB 2440
2840 TAG#1:MOVE 226,70:PRINT#1,"      ";:TAGOFF#1
2850 PAPER 5:SPEED INK 10,10
2860 PEN 9:LOCATE 7,8:mess$="1 : EXIT":GOSUB 2440:LOCATE 5,12:mess$="2 : CONTINUE":GOSUB 2440
2870 LOCATE 1,19:PEN 8:INK 8,26,0:PRINT"PLEASE SELECT 1 OR 2"
2880 k$=INKEY$:IF k$="2" AND men<>0 THEN praclev=praclev+1:INK 9,6:men=3:sc=0:CLS:WINDOW SWAP 1,0:GOTO 140
2890 IF k$="2" THEN CLS:INK 9,6:men=3:sc=0:WINDOW SWAP 0,1:GOTO 140
2900 IF k$="1" THEN 90
2910 GOTO 2880
2920 IF men=3 THEN 2970 ELSE LOCATE 4,18:mess$=CHR$(231)+" ":PEN 9:GOSUB 2440:PEN 1:mess$="FREE  LIFE":GOSUB 2440:PEN 9:mess$=" "+CHR$(230):GOSUB 2440
2930 freeman=freeman+10000
```

FREE ENTRY COMPETITION 6 NIGHTS IN NEW YORK

Nightingale
The Modem



The facts speak for themselves, **Nightingale** is without equal in its field. It is undoubtedly the most popular multi baud rate modem available today. Whatever your communication requirements, the simplicity of use and the versatility of **Nightingale** will enable you to provide a solution whether the need is to extract information from Prestel, send telex's via Telecom Gold, download telesoftware or exchange files, **Nightingale** will do the job and a whole lot more besides.

Nightingale operates at the two most popular baud rates 1200/75 as used by both private and public viewdata systems and 300/300 baud for communication with remote mainframe, mini or micro systems. Also available in 'reverse viewdata mode' 75/1200.

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APPROVED for use with telecommunication systems run by British Telecommunications in accordance with the conditions in the instructions for use.
S/2592/3/E/500065

The Software

A fitting partner for the Nightingale modem, this software has been developed to meet the demands of the discerning Amstrad User. With its powerful combination of Viewdata and ASCII terminal capabilities contained on Eprom. It will allow you to use to the full, the versatility of the Nightingale modem in accessing information from Prestel, sending or receiving files, or sending telex messages etc. It fully supports Dynamic Screens and also Telesoftware downloading from the Amstrad Database from Viewfax. Mode 0 is used to allow all eight colours to be used including flashing and double height characters to be displayed. 12 User function keys are used and Passwords and identity codes etc., may be programmed in using these. It comes complete with Dual channel RS232 Interface which can also be used for serial printers, plotters etc.

The Competition



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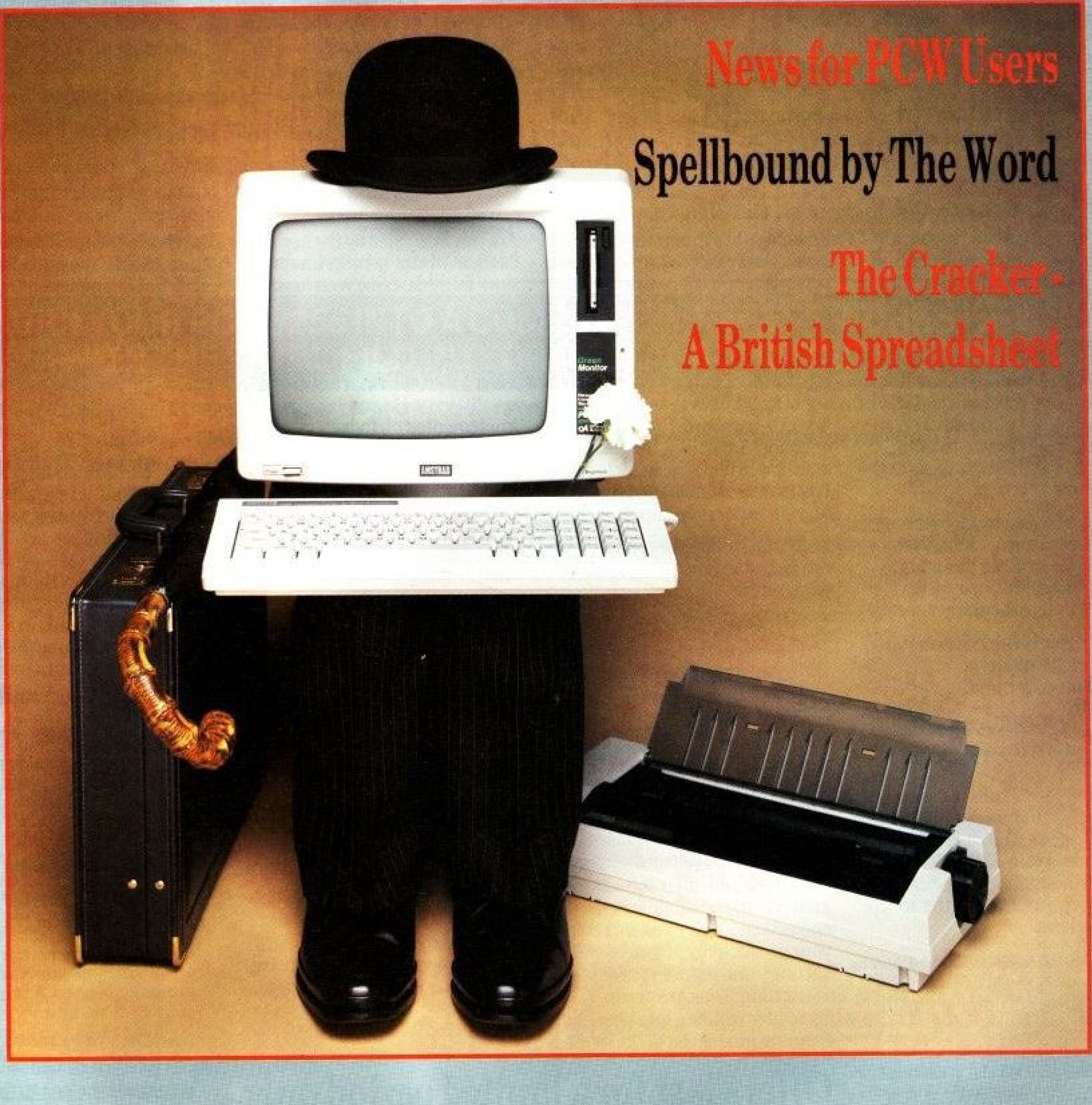
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Amstrad Business Computing

The supplement for Amstrad Business Computer Users

Free
January 1986
Volume one
Number two



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If you think you must BrainStorm.



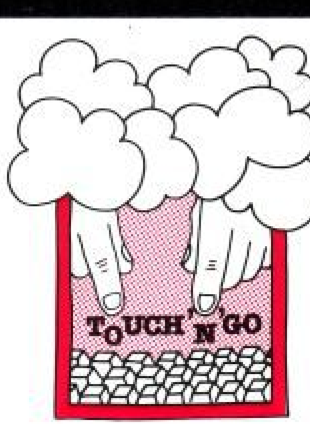
SmartKey has the power to dramatically improve the way your personal computer works for you, by customising and automating your keyboard and software.

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With these and other software products the possibilities are endless! SmartKey will increase your productivity, improve your accuracy and reduce your frustration. Your Amstrad computer will be a lot easier and a lot more fun to use.



Are you frustrated by the keyboard barrier? Would 'error prone and slow' fairly describe your keyboard skills?

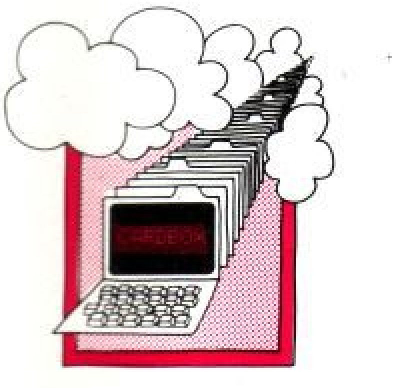
Touch 'N' Go will change all this. It is a carefully designed keyboard skills course developed over the last 20 years. Having been implemented on today's business micro-computers it has achieved success as the UK's most popular typing tutor. And now it's available for the Amstrad range of disk-based computers.

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Lading House, 10-14 Bedford St.,
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Tools not Toys

It's really quite exciting charting a revolution like the Amstrad PCW8256. It seems to have done just what Alan Sugar predicted it would - it's taken the electric typewriter market by storm, and the sales in the first few weeks are legendry. Judging by the long faces at Compec, it's also caused a slump in the PC market, although few dealers seem willing to admit that Amstrad is root cause.

Moreover, it has provided the vital incentive for the small business to dip its toe in the water with applications ranging from spreadsheets to accounts. However, the product is being shipped through mass merchandise outlets who simply cannot afford to get involved in great debates about the merits of software, and so an opportunity exists to follow the hardware revolution with a software revolution, by changing the way in which people perceive the whole business of using computers as tools not toys.

Amstrad owners, on the whole, do not read computer magazines. In fact, most 8256 owners don't know WordStar from a rocking horse. They are thus easily led when asking the question "What software exists to do....."

Visible Means of Support

However, they bring with them an important breath of fresh air, since they also cannot understand why software costs so much. Wordstar Professional at around the same price as the whole 8256 seems plain daft.

Rightly so. But if you strip the price down to match the 8256 philosophy something has to go. After the sleek black Porsches and the lambswool carpets, the most obvious overhead in business software distribution is the support.

Most publishers could do themselves and their customers a favour by producing comprehensible manuals (then maybe some users would actually bother to read them?), and then there is a new element in the Amstrad scene: John Etor's Amstrad Business Computing Group.

For an annual subscription based on factors such as the number of machines and type of programs you are running, chartered account and ex-business studies lecturer John Etor will provide a hotline service and series of training courses to support the Classic applications packages. An application form with each such package ensures even the most computer illiterate dealer has a Good Answer to the question of after sales support.

We wish John's scheme every success, and will be examining the philosophy in detail in the next issue. It deserves to succeed in the same way that the pioneering price cutters of hardware and software are proving that there really is a mass market out there, with the colossal benefits to Britain that will accrue from a truly computer literate business community after about 7 years of near total irrelevance.

If you can't wait to find out more, then drop us an SAE (no calls please - we're too busy just at the moment) and will see that details are sent on to you. **ABC**

ABC Update

Stan Martin, our man with his ear to the ground, nose to grindstone, eyes peeled and ears pricked keeps ABC Users aware of the talk on the street....

* *Guidance for the new PCW8256 owners*
* *Unrefusable offers for the trade*

Confused? You won't be....

OK Class, what is it you should always do first when you get your shiney new micro home? That's right - *copy the master discs!*

Impatient 8256 owners have been besieging the Amstrad switchboard because they have not bothered to copy the discs, and when using the master disc as a working copy, get strange messages, such as *'disc is write protected'* when they come to save and print their files. You could use the M: (ram) disc for working files of course, although you would left out on a limb when switching off.

The master disc has had the write enable tabs completely removed (after the experience of dealing with many Amstrad disc owners who had the rather jolly habit of formatting their master discs when the tabs were left in). So be a good lot, and remember to get some blank discs when you pick up your PCW8256, or you too will be faced with the awful prospect of being unable to save your first LocoScript masterpiece. And don't forget to format a few first either, since you can only format by exiting LocoScript, and wiping your document out before you can load CPM Plus.

And if all else fails, you can always **read the manual!**

Confused? You might be....

Oh dear, oh dear. The PCW8256 manual is not as concise on the subject of copying discs as it might have been. When copying discs, you must remember that each side of the disc is **read twice** (tracks 0-19 followed by tracks 20-39), and so the disc to be written must also be inserted **twice**. So in order to copy *both* sides of each master disc, you must insert 4 times in all.

The moral is simple; use the FORMAT option to ensure your blank disc is clean, and remember that you must insert and extract the disc to be read-from and copied-to *twice* for each side.

The problem is compounded by the apparent presence of a test pattern on certain 'blank' discs that look like the native format to the PCW8256. Thus it may not perform a *'Formatting whilst Copying'* routine, and thus get lost halfway through.

The moral is simple, use the FORMAT option to ensure your blank disc is clean, and remember that **you must insert and extract the disc to be read and copied to twice each side**. If you copy half the disc (tracks 0-19 only) it may still work after a fashion, but will crash sooner or later with a variety of messages, the most popular being the warning *'This is not a LocoScript document'* when the menu and directory say that it should be.

Confused ? You will be.....

The PCW8256 DISCKIT program will not copy earlier Amstrad disc formats. This is strange since it will happily *read* all the other formats. So since the CPC6128 will *not* read the PCW8256 disc format, the most popular medium for the distribution of software is going to be the CPC6128 DATA format.

Aha, but you can't then produce a simple copy can you? Right! You must first format the PCW8256 blank disc, and then use the venerable PIP under CPM to copy first to drive M:, and thence back out to the new disc. Or you can do it a file at a time using the

```
PIPB:=A:FILENAME.TST
```

approach.

Investigations with the public domain utility MFT.COM (distributed on recent UserSoft discs) are going on to see if this can perhaps speed things up, since you can specify a number of files at a time.

And now for the real clincher. The CPC6128 DATA format leaves 178K free on the disc. The PCW8256 format? You can have any format you like as long as it's 173K... Too bad for those distribution discs where the programs were just neatly squeezed down onto 178K with 1k to spare.

Arrrghh!

Is the Wordprocessor Output on the Wall?

Amstrad has panicked a number of computer sales organisations in the course of the last couple of months. Those with the most ashen faces are usually those whose present bread and butter stems from selling £3000 'computer' systems as word-processing and spreadsheet engines.

It is understandably hard to come to terms with the idea that your world has been turned upside down, and that your meal ticket has just been well and truly punched by someone better known for cheap audio equipment. (Although that image is changing very rapidly).

However, these people are missing the point. There ought to be rejoicing (re-Joycing?) in the high street computer stores because the PCW8256 is going to attract a whole new market into serious computing the right way. The market that will be most directly afffected will be the typewriter market and the home computer dressed as a business computer. Who could bring themselves to spend £400 on an electric typewriter now that the PCW8256 is available? And who would rather have an Electron and all those plug-ins instead?

Until now, the cautious and impecunious small business has been kidded that a viable system could be constructed from a souped-up home computer. The net result of which has been to convince most users of such an approach that computing is most definately not for them. The Sinclair QL nearly got it right, but the hopeless keyboard and unwise choice of microdrives only helped reinforce the difference between a home computer and a business computer. And as for systems cobbled together from a multiplicity of wires, add-ons, add-ins and compromise software: draw your own conclusions.

One journalist *(you know who you are, you rogue!)* even suggested that the advent of the Spectrum Plus with its 'typewriter-style keyboard' elevated the Spectrum into the realm of a 'serious small business machine'. With drivel like that doing the rounds, it's not surprising that many newcomers feel cheated and grossly misled.

Many users have been blighted by these formative experiences, and may take a while to come back down to the water's edge, let alone take the plunge with £3000 worth of what they firmly believe will be a potential nightmare.

ABC

The Word

In which David Ward is bewitched by a spell checker.

There is no excuse for this publication to misspell anything ever again. Of course it will continue to make mistakes, but there is now no reason, thanks to The Word Plus: a neat package for the illiterate from Oasis Systems Inc., from the Golden Age of CP/M.

Those readers who have chanced across MicroPro's SpellStar tacked onto WordStar will justifiably be suspicious about the validity of electronic spell checking. However, a few moments with The Word Plus will turn you into the office spell checking bore with your new found missionary zeal to tell the world just how darn good this new program you've just uncovered really is.

Deposited calcium carbonate versus Fortnum's finest Stilton

The difference between SpellStar and The Word Plus is the difference between chalk and cheese. However, since Spellstar will not run on a standard CPC6128 or PCW8256 (unless you have the second drive fitted on the '8256), maybe this argument is academic. But just as WordStar is the reference point for any connoisieur of wordprocessing, so the spelling add-on must also be considered as de rigeur.

SpellStar runs as a subsiduary overlay under the main menu of Wordstar, and as such has the appearance of integration. In truth, the menu only calls SpellStar into the memory and on exit, reloads WordStar. But the arrangement of the files (and the dictionary alone is 100k long) makes it impossible to run on the 169-178k range of Amstrad formats.

The Word, on the other hand, is a stand-alone product from the same stable as NewWord, and presently comes bundled along with the delightful WordStar work-alike NewWord at the silly price of £69. It's worth more than that on its own.

What you get

The Word Plus as supplied from New Star Software is shoe-horned onto a DATA format disc with 2k to spare. This means that it cannot all fit onto a 173K '8256 native format disc. This is actually no problem, since there are several non-essential programs in the package that can be used occasionally as required, but it does highlight an annoying feature of the 8256 DISCKIT program: it will not copy 6128 DATA discs, nor any format other than its own native format.

Owners with the CPC6128 have no problems backing up with DISCKIT3, but PCW8256 owners read on......

To produce back-ups, you must copy via the RAM disc (drive m:), or PIP files one at a time. And in case you are wondering, the 8256 CPM Plus PIP managed to copy the 136k dictionary file in 3 chunks, prompting the user to insert and remove the source and destination disc in all the right places.

A hyphen utility described in the manual is also not supplied on the distribution disc for reasons of space, and because NewWord itself provides the same function rather more conveniently.

In fact, the process of copying from the DATA format as distributed onto the 'native' PCW8256 disc is recorded in a 'PUT' file supplied on the disc. 'PUT' is one of the lesser known CPM 3.1 utilities that

The Word Plus
Published by OASIS systems
£49.95 or bundled with NewWord at £69.00
UK Distribution: New Star Software Limited
22 Middleton Road, Brentwood, Essex

allows the user to create a disc file of console output (amongst other things). I reproduce the file here so you can see just how the process goes:

Owners with the CPC6128 have no problems backing up with DISCKIT3, but PCW8256 owners read on......

First you copy the two utilities you will need from side two of the system disc into the M: disc of the PCW8256....

```
A>pip
CP/M 3 PIP VERSION 3.0
*m:x.com=dir.com
*m:=pip.com
*
```

Then using the sorted directory command, insert the master disc and see what's there......

```
A>m:x
Scanning Directory...
Sorting  Directory...
Directory For Drive A:  User  0
    Name     Bytes  Recs  Attributes     Name     Bytes  Recs  Attributes
------------ ------ ------ ------------ ------------ ------ ------ ------------
ANAGRAM  COM    2k     10 Dir RW      DICTSORT COM    2k     14 Dir RW
ERRWORDS TXT    3k     21 Dir RW      FIND     COM    2k     10 Dir RW
HOMONYMS TXT    6k     47 Dir RW      LOOKUP   COM    2k     16 Dir RW
MAINDICT CMP  136k   1087 Dir RW      MARKFIX  COM    4k     28 Dir RW
REVIEW   COM    6k     42 Dir RW      SPELL    COM    4k     32 Dir RW
TW       COM    3k     24 Dir RW      UPDICT   CMP    1k      1 Dir RW
WC       COM    2k     10 Dir RW      WORDFREQ COM    3k     20 Dir RW
Total Bytes     =    176k  Total Records =    1362  Files Found =   14
Total 1k Blocks =    176   Used/Max Dir Entries For Drive A:   22/  64
```

More than you can manage in one-trip to the M: disc, so first pick the big one and copy this using the feature that maps two logical drives onto the one physical device. Although not seen in the 'PUT' file, this involves swapping the master source disc and the destination disc three times. You get prompted by messages on the status line.

Immediately after the main file is copied, the rest are then copied into the RAM disc by using the wildcard copy feature, together with the confirm ([c) option available in PIP under CPM 3.1. Note that MAINDICT.CMP and HOMONYMS.TXT are omitted from this process.

The contents of the RAM disc are then copied, again using the confirm option, back onto the destination disc that already contains the MAINDICT.CMP file:

```
A>pip
CP/M 3 PIP VERSION 3.0
*b:=maindict.cmp
*m:=*.*[c

COPYING -
ERRWORDS.TXT (Y/N)? y
SPELL.COM (Y/N)? y
TW.COM (Y/N)? y
MAINDICT.CMP (Y/N)? n
ANAGRAM.COM (Y/N)? y
DICTSORT.COM (Y/N)? y
FIND.COM (Y/N)? y
HOMONYMS.TXT (Y/N)? n
LOOKUP.COM (Y/N)? y
MARKFIX.COM (Y/N)? y
REVIEW.COM (Y/N)? y
WC.COM (Y/N)? y
WORDFREQ.COM (Y/N)? y
UPDICT.CMP (Y/N)? y
*a:=m:*.*[c

COPYING -
TWREAD.ME (Y/N)? n
PIP.COM (Y/N)? n
ERRWORDS.TXT (Y/N)? y
X.COM (Y/N)? n
SPELL.COM (Y/N)? y
TW.COM (Y/N)? y
ANAGRAM.COM (Y/N)? y
DICTSORT.COM (Y/N)? y
FIND.COM (Y/N)? y
LOOKUP.COM (Y/N)? y
MARKFIX.COM (Y/N)? y
REVIEW.COM (Y/N)? y
WC.COM (Y/N)? y
WORDFREQ.COM (Y/N)? y
UPDICT.CMP (Y/N)? y
*
```

By which point, you should have your working copy on natiive PCW8256 format.

The file omitted is one relating to words that sound similar (HOMONYMS.TXT) but are differently spelt. Examples given in the very comprehensive accompanying manual are:
NAVAL and NAVEL,
WAVER and WAIVER,
COLONEL and KERNEL etc.

As you can see, these are not actually part of the process of spell checking and document fixing and so can safely be omitted. In fact, the suite of programs that comprise The Word Plus are:

TW: the manager,
SPELL: the lookup system,
REVIEW: the interactive part that asks the user to confirm errors, and
MARKFIX: the program that goes through the document and fixes the corrections where required.

The great beauty of this approach is that if you spell 'independent' incorrectly throughout your thesis on Proust (or whatever), then you only need to fix the spelling of 'independant' once and all occurrences are taken care of in one fell swoop. Wonderful.

So what about those other utilities before we go on to examine the main function in more detail?

FIND is a great aid to crossword cheats. You simply enter the word you want to complete by using letters where you have them, and question marks where you don't:

```
A>find b?n???
FIND - VER 2.0,
Copyright 1981 - Oasis Systems
BANANA          BANDED          BANDIT
BANGED          BANGLE          BANISH
BANJOS          BANKED          BANKER
BANNED          BANNER          BANTAM
BANTER          BANTUS          BENGAL
BENIGN          BENITA          BENITO
BENSON          BINARY          BINDER
BINDLE          BINGES          BONBON
BONDED          BONING          BONITO
BONNER          BONNET          BONNIE
BUNCHY          BUNDLE          BUNGLE
BUNION          BUNKER          BUNTER
BUNYAN

A>find AM?????
FIND - VER 2.0,
Copyright 1981 - Oasis Systems
AMADEUS         AMALGAM         AMASSED
AMATEUR         AMATORY         AMAZING
AMAZONS         AMBIENT         AMBLING
AMBROSE         AMENDED         AMENITY
AMERICA         AMERIGO         AMHERST
AMIABLE         AMIABLY         AMMONIA
AMNESIA         AMNESTY         AMONGST
AMORIST         AMOROUS         AMOUNTS
AMPLEST         AMPLIFY         AMPOULE
AMPUTEE         AMULETS         AMUSING
```

LOOKUP is a utility that can be invoked from REVIEW when checking though the list of misspelled words in a document, it also stands alone as an electronic dictionary if you don't want to bother with all the palava of the complete process of checking a whole file. And it's a lot, lot quicker than finding the dictionary (which has usually been borrowed) and then thumbing through:

```
A>LOOKUP INDEPENDANT
LOOKUP - VER 2.0,
Copyright 1981 - Oasis Systems
INDEPENDENT

A>LOOKUP GRATEFUL
LOOKUP - VER 2.0,
Copyright 1981 - Oasis Systems
GRACEFUL        GRATEFUL*
```

As you can see, the actual word on the command line is starred to indicate that the spelling is valid.

Finally, there's **ANAGRAM**. Which is just what it says it is supposed to be. Great for scrabble cheats:

```
A>ANAGRAM STAR
ANAGRAM - VER 1.0,
Copyright 1981 - Oasis Systems
ARTS            RATS            STAR
TSAR

A>ANAGRAM COMPUTER
ANAGRAM - VER 1.0,
Copyright 1981 - Oasis Systems
COMPUTER
```

Word Count (WC) is rather obvious. It counts the number of words in the document given after the command. WORDFREQ is less obvious (but not a lot), and counts the number of times each word occurs in a document.

```
A>WORDFREQ M:TESTING.ABC
```

Convert your Amstrad 464 into an Amstrad 6128*

64K and 256K Memory Expansions for the CPC 464 Computer.

* **Total of 128K or 320K RAM available to user.**
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* **Compatible with DKtronics 256K Silicon Disc.**
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The 64K memory will give you the same amount and configuration of RAM as the CPC 6128, the 256K gives an extra 192K on top of this! The expansion will allow the use of CP/M+® opening up an even larger software base for Amstrad users.

The RAM can be accessed by means of bank switching using a single I/O port. Memory is actually switched in and out of the 64KZ80 address space in 16K sub-blocks (as are the ROMs). The port determines which particular combination of the original four 16K sub-blocks and any new sub-blocks from the expansion RAM will occupy the 64K address space at any time. The I/O port can be used from both BASIC and machine code. To use the additional 64K/256K, the expansion is supplied with bank switching software (although it can be switched without this software). The program adds some extra BASIC commands which make it possible to use the second 64K (or 3rd, 4th and 5th in the case of the 256K expansion) for storage for screens, windows, graphics and BASIC arrays. This ability means that you can write much larger BASIC programs, as most of the memory on the unexpanded CPC 464 is normally used for arrays, variables and graphics.

The additional BASIC commands are:

|BANK,n	Map a bank of 16K directly into memory space.
|SWAP	Alternate between the low and high screens.
|LOW	Change to the low screen.
|HIGH	Change to the high screen. (Default screen).
|SAVES,n	Store a screen to 16K bank
|LOADS,n	Retrieve a screen from a 16K bank
|SAVEW,w,n	Store a window's contents into expansion RAM.
|LOADW,w,n	Load a window with data from expansion RAM.
|SAVED,n,s,1	Transfer original RAM to expansion RAM.
|LOADD,n,s,1	Load original RAM from expansion RAM.
|PEEK,n,s,v	Read the value of a byte in expansion RAM.
|POKE,n,s,v	Change a byte in the expansion RAM.

These commands make such features as pull down menus, full screen animation, and large spread-sheet type programs or Data-Bases very easily programmed from BASIC as never before possible on the unexpanded CPC 464.

NOTE: The contents of the expansion RAM are retained if the computer is reset. The consequence of this is that if the RAM is used for machine code, the contents will remain even if the computer crashes!

Available for 664 and 6128 1st November 1985.
*Except for differences in the firmware and BASIC ROMS.

dktronics

THE POWER BEHIND YOUR AMSTRAD

```
--> DIS Corrected to -> DISC
--> DISCKIT - [D]
--> DISC - [D]
--> DISC Corrected to -> DISC
--> ERRWORDS - [D]
--> ETC - [D]
--> FORTNUM - [D]
--> ILLTERATE - [L]
Checking Dictionary...
0 illiterate
```

```
REVIEW+  Version 1.2, Copyright 1981 - Oasis Systems
Add word to:                        Other options:
 U>pdate Dictionary                   P>revious word
 S>pec. Dict. "SPECIALS.CMP"          N>ext word
M>ark word                            R>esume review
D>iscard word                         L>ook up word
C>orrect word                         V>iew context
--> ILLTERATE - [C] [0]
--> ILLTERATE Corrected to -> ILLITERATE
--> INC - [D]
--> INDEPENDANT - [D]
--> KERNAL - [C]
--> KERNAL Corrected to -> KERNEL
--> LOOKUP - [D]
--> MAINDICT - [D]
--> MARKFIX - [D]
--> MICROPRO - [D]
--> NON - [D]
--> PALAVA - [D]
--> PCW - [D]
--> RECS - [V]
```

```
er 0    Name     Bytes   Recs   Attributes      Name       B
REVIEW+  Version 1.2, Copyright 1981 - Oasis Systems
Add word to:                        Other options:
 U>pdate Dictionary                   P>revious word
 S>pec. Dict. "SPECIALS.CMP"          N>ext word
M>ark word                            R>esume review
D>iscard word                         L>ook up word
C>orrect word                         V>iew context
--> RECS - [D]
--> RELOADS - [D]
--> RIGEUR - [D]
--> RW - [V]
```

```
ANAGRAM  COM      2k      10 Dir RW        DICTSORT COM       2k
REVIEW+  Version 1.2, Copyright 1981 - Oasis Systems
Add word to:                        Other options:
 U>pdate Dictionary                   P>revious word
 S>pec. Dict. "SPECIALS.CMP"          N>ext word
M>ark word                            R>esume review
D>iscard word                         L>ook up word
C>orrect word                         V>iew context

--> RW - [D]
--> SHOEHORNED - [D]
--> SPELLSTAR - [D]
--> STILTON - [D]
--> SUBSIDUARY - [D]
--> TPA - [D]
--> SUBSIDUARY D
--> TPA - [D]
--> TW - [D]
--> TWREAD - [D]
--> TXT - [D]
--> UPDICT - [D]
--> UPS - [D]
--> VER - [D] [P]
--> WORDPROCESSING - [D]

-->
End of list.  Press "return" if done. [RETURN]
```

(A few have been taken out here for lack of space...)

```
MARKFIX+  Version 1.4
Copyright 1981 - Oasis Systems
2 words marked
6 words corrected
4 words changed length.   * reform *
Completed file M:SPELLTST.ABC
A>type errwords.txt
AMONGST/AMONGST
CONESSIEUR
DIFFERENTLY/DIFFERENTLY
DIS/DISC
DISC/DISC
ILLTERATE/ILLITERATE
OCCURRENCES
UTILITIES/UTILITIES
```

...back again. As you can see, TW lists the words it cannot match alphabetically, and allows the user a number of direct options. In a jargon strewn business such as this, there are bound to be a lot of unmatchable buzz words, so you can either throw them away, or compile a supplemental UPDATE.CMP dictionary for them so they are not trapped next time around. The general impression is definately that the Word Plus dictionary is twice as well informed as SpellStar's.

Note that words that change length can also be marked. I tend to use the unjustified mode of wordprocessors, so this isn't usually much bother. Pedants with justified documents will need to re-form lines where a correction causes a length change, and this too can be marked. This highlights the sad loss of LocoScript's most magical features from WordStar and NewWord - the auto reformat whilst maintaining paragraph tab indents. NewWord goes part of the way with extra dot commands for margins settings, but LocoScript does the lot.

View Context is a most useful feature, since in technical features it is very simple to lose track of abbreviations (such as those tagged in the above exercise) and being able to view the words either side of the unknown word is most useful.

Limitations

The authors are honest enough to point out that the subtleties of the language coupled with the fact that the spell checker is not a context checker mean that it will still be necessary to read through the document to trap events such as words that are completely missing, and the extraneous presence of correctly spelt but irrelevant words that sometime get left behind in the word processing process (block moves that start or finish a word out, for example). Spell checking will not turn you into a Shakespeare, although the use of FIND to suggest rhyming words might make you into a passable poet.

Conclusions

The Word is a great boon, and should be compulsory for the editor of this magazine. It is simple to use, comes with a terrific manual (that is an example to anyone writing software support documentation) and will trap over 85% of errors in typed documents. It has a number of frilly extras that are a lot of help to the professional wordsmith.

That it should come free with NewWord is quite astonishing. But before you declare that this is a waste of time since you already have LocoScript (if you are one of the growing band of PCW8256ers) then hold hard.

Lococript does not work in ASCII files, nor the pseudo ASCII offering of the NewWord and WordStar document formats where the parity (8th) bit is used as a feature marker within the text but simply filtered out when displaying, printing and spell checking.

It would be nice to have the second disc drive so you didn't have to worry so much about space management: but overall, the Word is a best buy for Amstrad CP/M users.

Go out and bye a coppy twoday.

ABC PODIUM

A feature in which we let software authors have their own say on their own product.

Ian Searle, author of the UK's (only?) major 'native' spreadsheet and modeller for CP/M, MSDOS, PCDOS etc., gives Amstrad Business Computing readers an overview of his baby. But still fails to explain just why he called it....



The Cracker!

With the mathematical and financial modelling world dominated by all those well-known heavily marketed US products, just see what you might have overlooked what's lurking in the depths of Birmingham. You will probably be surprised at what you may have been missing.

The purpose of this article is to introduce you to THE CRACKER and perhaps give you a feel for the power of this spreadsheet program. Your may well be wondering just what is a spreadsheet program and why should I need one. Lets start with the relative importance of this type of program. How does it compare to BASIC? You may think this it is oddd to compare it to a computer language, but not so odd when you look into it in more detail.

What would you use BASIC for? You have a problem that needs solving or some data that needs collecting together. You want to do some calculations or rearrange the the information and finally you want to set out your results neatly in a presentable form. In a nutshell, that's what computing is all about. To solve this problem in BASIC would involve quite a lot of work. The instructions have to be given to collect information from the keyboard, the formulae have to be entered and finally you have work out the intructions needed to put the answers neatly on the screen. But you haven't finished there - it doesn't work properly! It never does. It is a fact of life that it takes you three times as long to find your programming mistakes as writing the program in the first place. It's often ten times as long!

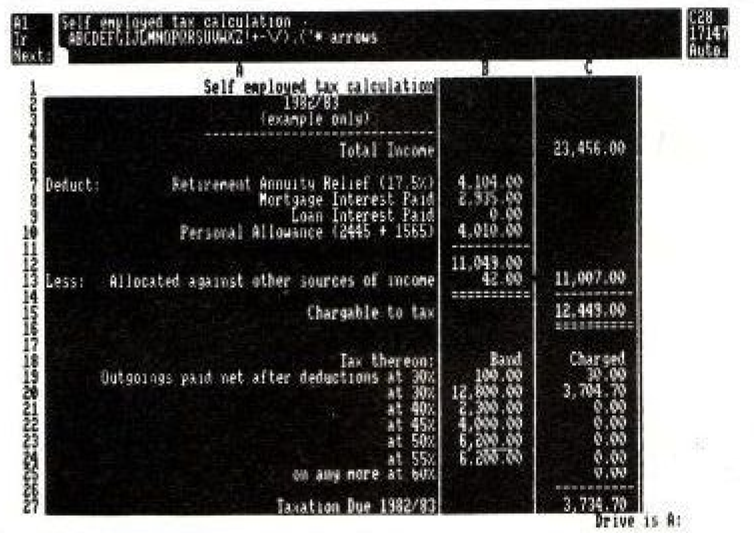
That is a summary of how you would solve a computing problem in BASIC. What has this to do with a spreadsheet program like The Cracker? Let's take the first stage -collecting the information.

The name spreadsheet has evolved because of the displayed similarity between a ruled sheet of paper and the way the screen is laid out. In a few seconds this sheet can be created to your very own special requirements. It will have rows and columns which divide the sheet into a series of pigeon holes

All the true spreadsheet packages have developed from the original VISICALC program. Most have kept to the original layout but added bells and whistles. This applies from the most expensive downwards. The Cracker uses the same principles but is very different in how they are applied. If you have used other spreadsheets you will at least feel at home but you will be surprised at how much easier it is to achieve you aims.

On most spreadsheets as you enter information the error checking is very crude. With one well known program, if you make a mistake in entering a formula it doesn't even tell you it is a mistake but assumes you are putting in a descriptive text entry. If your mistake then goes unnoticed all your work will calculate incorrectly. With another program if you put in a second decimal point, it waits untill you press return and gives the message. 'Error 8-› 2..3 hit space [A1]' You can draw your own conclusions.

Whenever you enter anything with The Cracker it is continually being checked as you press each key. It does not just check that your entry is of the right form (syntax) but checks the arithmetic and logic also at the same time. In fact it carries out a dummy calculation to test your entry before it is put into the worksheet. By the time you press return it has to be correct, except for errors of intent. This is the first big improvement on the basic spreadsheet principle.



One of the supplied samples

The second problem with spreadsheets is that they usually carry out their calculations in a predefined way. Generally across the columns and down the rows, or vice versa. This means that for a correct calculation you must have your data and formulae in the right order. A formula may be waiting to use a value that has not as yet been calculated. A second totat recalculation or a third or more may be needed to get the right answers. Some spreadsheets automate this multiple recalculation, but The Cracker is very different. When you enter a formula The Cracker decides itself just when it should sensibly be calculated. Don't worry you don't do anything its all automatic. This means that no matter how random your sheet it always calculates in the shortest possible time. For larger sheets this can be a big time saver. It will give you more confidence that what you see in front of you is always correct.

Auto Hand Holding

Because The Cracker keeps a track of the logic of the sheet as a whole it can tell you when you are trying to do something silly like deleting important areas. Before implementing any of your commands it does a full check to make sure that the command is sensible and if not it lets you know and doesn't do it.

All the basic operations available on other programs are available with The Cracker with the added bonus that there are very few limitations. On most programs there are restrictions on what you can copy or move or delete. With THE CRACKER you can do all operations right down to a single specified cell. You can even copy a single cell to a disk file, if of course you want to.

Often you will want to copy formulae to be used elsewhere on your worksheet. The problem is that as you copy formulae you will want parts of it adjusted to reflect its new position in the worksheet. Most programs specifically ask you to tell them which bits are to be adjusted. This can be time consuming and tedious. The Cracker does all this for you automatically and it can cover all circumstances. With THE CRACKER you don't even have to think about it.

You may be beginning to appreciate that when you use THE CRACKER it will appear very easy to use. This is not because it is unsophisticated or simple but because it is working harder behind the scenes to make life easier for you. It is positively trying to make sure that you never go wrong. Well not very often!

One Upmanship

What has The Cracker got that other spreadsheet may not have? It has DO.. WHILE functions that allow looping within the sheet. It has MACRO commands that allow you to predefine commands for later use. This may be for loading files or printing out parts of the sheet. You can define functions of your own or even use groups of formulae repeatedly in different parts of the sheet. These in computing terms are equivalent to defined functions and subroutines.

There are built in functions for doing statistical analyses, complex logic and higher mathematics. There are special functions for cash flow calculations and tax assessments. Probably you will never want to use most of these funtions, but they are there if you do need them. You can do basic database work such as keeping address lists. You can sort these and search for particular items. The Cracker even has the ability to print out addresses as mail labels. A powerful addition to any spreadsheet is the ability to draw graphs and this feature will shortly be available.

The Cracker is unrivalled in its ability to talk to other programs. It can receive and send information to BASIC and FORTRAN programs. It can interpret information from word processing programs. You can prepare a table on your word processor and bring it into The Cracker. Files can be written and read in DIF Data Interchange Format which is

or cells. So how do we collect the information? Very simply by typing it in on the entry line. When you have finished it goes straight into the cell want and you can see it there on the screen. How is this different from the way your BASIC program would collect data. Probably you would have an entry line which says 'Enter number' which you would do, and that would be the last you see of it. If you make a mistake you couldn't go back and change it. If you make a mistake in entering it you will get a message like 'Redo from start' when you press RETURN.

Is The Cracker really any better? Yes if you make a mistake like entering two decimal points instead of one, you get an immediate message saying 'Second . ' and you only have to backspace to correct it. It may seem the obvious way to do things but amazingly enough this seems, as present, to be unique to The Cracker. If you realised later that you had put in the wrong number you simply put in the correct number on top of the old entry.

That covers the collection of information from the keyboard. How about doing calculations? Let's take the simple example of adding up the numbers that you may have entered in the first stage. In BASIC you would need to keep a running total and loop back to the INPUT statement each time. You mustn't of course forget to zero your counter before your start, and you have to think of some way of stopping. In the example below a value of -1 is used to tell the program to stop.

A very simple BASIC version might be

```
100 b+0
110 PRINT "Enter Number"
120 INPUT a
130 IF a=-1 GOTO 150
140 b=b+a
150 GOTO 110
160 PRINT "The total is ";b
170 END
```

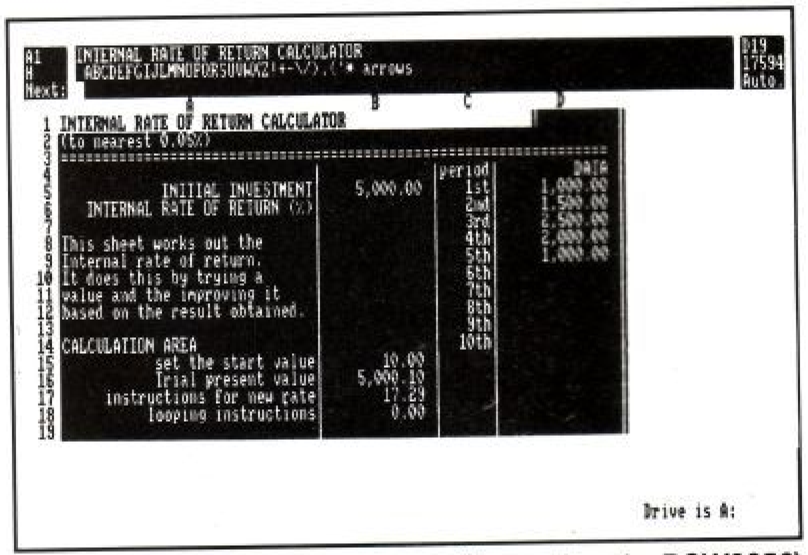
To do the equivalent with The Cracker you enter a small formula like 'sum(B1...B10)' in any blank cell. This formula means 'sum' or 'add up' all the cells between B1 and B10. The 'B' stands for the second column and the '1' and '10' for the the line numbers. This assumes that you put your numbers in those cells. Not much programming required there! When you have put in the formula you will in fact see the answer you want in the cell. You can flip the display at any time to see the formulae behind the scenes. All right so it was easier to set up. But what if you want to change some of the data? Easy you just overwrite it and the new total will be calculated automatically. In the BASIC program above you have to re-enter all the data!

Consider what you would have achieved with The Cracker at this stage. You have entered data, added it up and there was no programming apart from knowing how to write 'sum(B1...B10)'. It didn't matter where you put the formula and there was full error checking with backspace correction at all times.

The last stage is to print out your information for presentation. You are going to need a few more lines of program in BASIC, something like:

```
100 b+0
110 PRINT "Enter number "
120 INPUT a
130 IF a=-1 GOTO 150
140 b=b+a
150 PRINT USING "#######.##";a
150 GOTO 110
160 PRINT "The total is "; USING "######.##";b
170 END
```

The equivalent with The Cracker is 'Copy All to Printer' actually you only type the first letters. The information as laid out on the screen goes straight to the printer. If you want to change your presentation you just change the display on the screen. You can move cells from one spot to another, you change the number of decimal places of a number, change the column widths, put in explanatory text or headings - and all with a few keystrokes. And what you see is what you get!



A typical Cracker screen (dumped on the PCW8256)

So why use BASIC? Perhaps The Cracker can only be used for simple things like the example of adding up figures. Not at all The Cracker has more built in features than BASIC. It can read and write from disk files, do calculations to high precision (15 digits), do looping to hunt for an answer. There may be some circumstances when BASIC has to be used, but they are few enough to be the exception rather than the rule.

Perhaps you are now wondering whether you should be wasting any more time with BASIC and shouldn't you be changing over to using a spreadsheet program. Your next consideration is probably which spreadsheet program. Surely they are all much the same aren't they? The answer is definitely not. For a start there are spreadsheet programs and there are programs that use a spreadsheet type of display. This second type uses a programming language like BASIC and only outputs the information in a spreadsheet format. These programs are not as flexible as true spreadsheet and you end up writing a program like the BASIC example above.

common to most spreadsheets and graphics packages. Your spreadsheets can even be converted to dBASE II files, and back of course.

```
A1     INTERNAL RATE OF RETURN CALCULATOR                              D19
H       ABCDEFGIJLMNOPQRSUVWXZ!+-\/),('% arrows                        17594
Next:                                                                  Auto.
                    A                      B          C          D
  1IINTERNAL RATE OF RETURN CALCULATOR
  2 (to nearest 0.05%)
  3 ==================================================================
  4                                                 period       DATA
  5              INITIAL INVESTMENT      5,000.00     1st      1,000.00
  6    INTERNAL RATE OF RETURN (%)                    2nd      1,500.00
  7                                                   3rd      2,500.00
  8 This sheet works out the                          4th      2,000.00
  9 Internal rate of return.                          5th      1,000.00
 10 It does this by trying a                          6th
 11 value and the improving it                        7th
 12 based on the result obtained.                     8th
 13                                                   9th
 14 CALCULATION AREA                                 10th
 15             set the start value         10.00
 16             Trial present value      5,000.10
 17       instructions for new rate         17.29
 18           looping instructions           0.00
 19
```

A typical printout

The last thing you shouldn't forget is how safe is the spreadsheet? The Cracker automatically takes a copy of your work on exit as a standby in case you forget to do it yourself. If you create a second sheet of the same name your previous version is preserved, so you can go back a step if necessary. The Cracker checks all incoming and outgoing spreadsheets to make sure they have not become corrupted. It even has the ability to rebuild damaged spreadsheets, and this is all automatic. This should never happen but if you are unfortunate rest assured that consideration of the safety of your work is built in.

This introduction should have convinced you of two things. First it is much easier to use a spreadsheet program than to do the equivalent operation with BASIC. Secondly that if you are going to use a spreadsheet then The Cracker will be your best tool for the job. Well it's very difficult to get the author of a program to give an unbiased opinion of its merit!

Product: The Cracker
Published by: Software Technology
Amstrad versions available from: New Star Software
Price: £49.00

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Screen shots from the Amstrad.



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Please add 80p P&P to your order. Payment by cheque to Palace Software, Postal Order or by Access/Barclaycard No. ____________

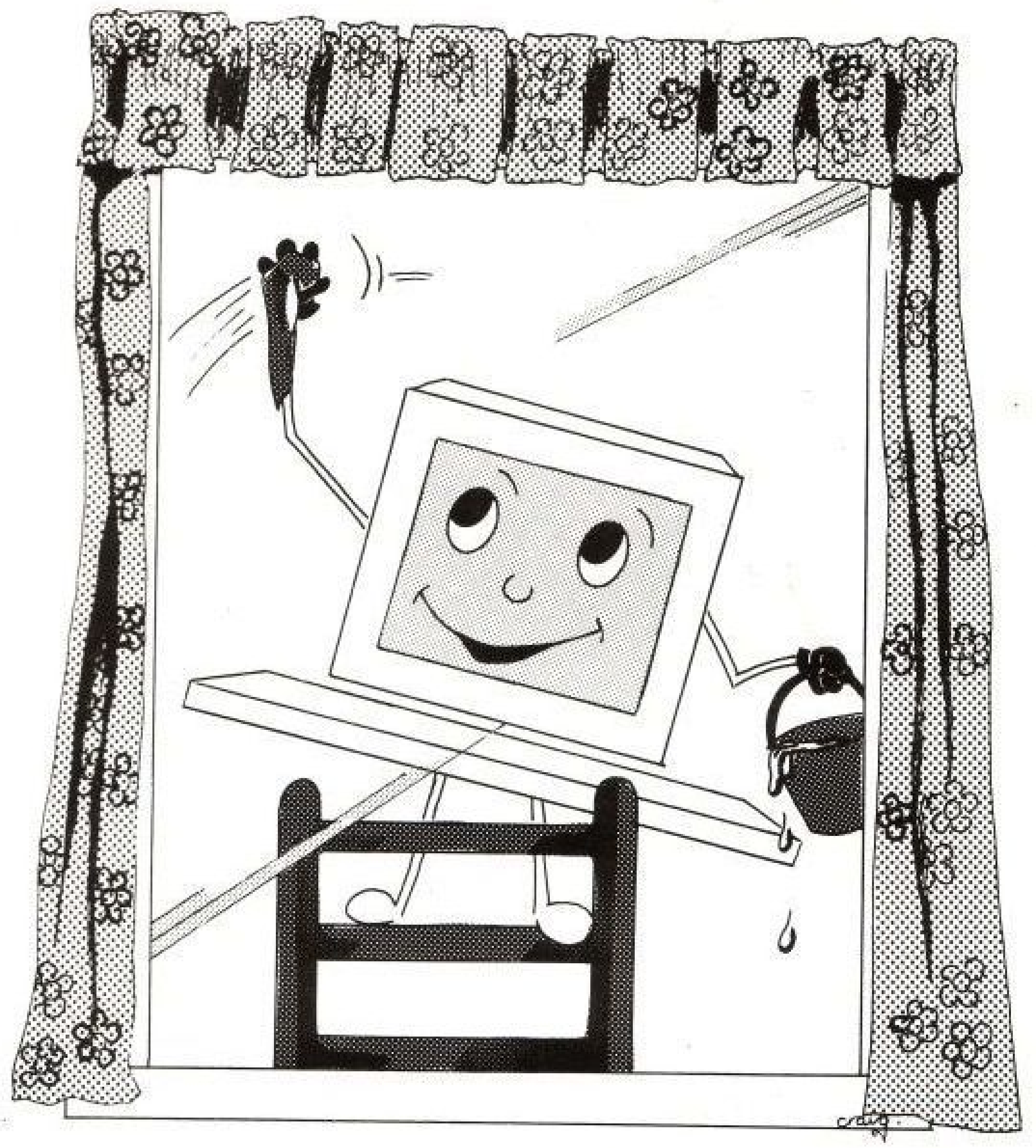
Name: ____________

Address: ____________

____

____

____________ Postal Code ____________



Hi - Speed Windows

A series for beginners By Richard Sargent

The way in which computers organise their screen layout is by no means simple, and no standard screen layout or operating technique has developed during the short evolution of the home micro. The Amstrad screen is, of necessity, complicated; the computer has to be capable of producing an 80-column screen for business and programming, a multi-colour screen for games and a general purpose screen for everyday use. The computer has three screen modes to help it with these tasks, and there are some things that can be done in one mode but not in another. The reason why the screen display on home micros is the victim of compromise is quite simple - there is insufficient memory (and often insufficient processing speed) to produce the ideal screen which would have high-resolution graphics combined with 256 shades of colour and fast text scrolling into the bargain.

However, if you understand the peculiarities of your micro's screen, you will be able to use it to the full. This and subsequent articles will show you how to manipulate the Amstrad screen in Basic and, more importantly, will demonstrate machine-code routines which will develop screen displays which Basic would be too slow to achieve.

The Basic Screen:

Mode 1

The Amstrad screen occupies &4000 or 16K of memory, but is regarded by Basic as a piece of graph paper divided into tiny squares. There are 640 of these along the horizontal or X axis and 400 along the vertical or Y axis. On some computers these squares represent the actual screen pixels. This area is the graphics screen, and its origin is 0.0 at the bottom left-hand corner of the screen. This graph paper may also be ruled off into larger squares, the character blocks, of which there are 40 along the horizontal axis, or columns, and 25 along the vertical axis, or rows. The origin of this text screen is the top left-hand corner of the screen and it is 1,1. On the text screen, coordinates 0,0 are illegal.

Windows

Although graphics and text share the same physical RAM memory and the same screen (or graph-paper), different ways of labelling that graph-paper are possible and can exist simultaneously. For the text screen, these labelling systems

are known as windows, and you can create as many as eight of them at any one time. When you first switch on the computer or give MODE 1 command, WINDOW 0 is automatically created to the dimensions 1,40,1,25, which is the full dimension of the screen 1 to 40 columns wide and 1 to 25 rows deep. The computer manuals (Ch.5, p.10 for the 464 and Ch.9, p.26 for the 6128) explain WINDOWS and the examples given there should be studied carefully. The main point to be aware of is that data can be directed to a specific window and that a window can be scrolled, cleared and used to print INPUT prompts just as though it were a mini-screen in its own right.

The window has its own coordinate system, so that the top-left of a window is always accessible by LOCATE# n,1,1, no matter where the window is positioned on the screen. The windows are numbered 0 to 7 and the default size for them all is 1,40,1,25. Since this covers the entire screen, the windows are not particularly noticeable until they are cut down in size. Changing the dimensions of a window is achieved simply by issuing a new set of coordinates by telling the computer whereabouts (with reference to the whole screen) the new edges of the window are to be.

Thus the command WINDOW# 7,38,40,23,25 creates a small window in the bottom right-hand corner of the screen and thereafter LOCATE# 7,1,1 and LOCATE 38,23 both point to precisely the same physical point on the screen. LOCATE# 0,28,23: if the window you want is 0, the 0 may be omitted. Overlapping windows are permitted. Program listing and the 'Ready' prompt appear in WINDOW 0 so it is inadvisable to set it to small dimensions. Consult one of the manuals which advises that before you start experimenting you should set a spare key (such as 0 on the numeric pad) in the following manner:

```
KEY 128,"MODE 1:INK 0,1:INK 1,24:PAPER 0:PEN 1:CLS"+CHR$(13)
```

If you create small windows or strange colour combinations you will find it difficult to read (and therefore check) commands that you give the computer. By pressing key-pad 0, or f0 on the 6128, normality will be restored.

Printing messages, prompt, and calculation results onto screen windows rather than onto the screen as a whole is a sensible way to use a computer and the visual appearance of any program is likely to be enhanced by the use of just a few windows. Technically, windows are important because they stabilise the screen memory addresses and this is of special importance when it comes to a machine code programming because it makes the task of writing code that much more simple. A window can set aside a portion of screen which Basic does not use and so prepare the way for a machine code routine to handle that part of the screen memory directly.

The windows share the screen with each other, but they also share the screen with the graph paper. It is essential to understand how the graphic's screen windows interact, but now that windows are no longer a mystery, a short program can illustrate the workings of the graphic screen.

Type in Listing 1 exactly as it is shown, with the REM keywords 'protecting' certain instructions. With the listing in the computer (and saved), type MODE 1 directly, followed by RUN. A triangle is partly drawn and the screen coordinates of the various points of the triangle are printed, causing both the text and the graphics to scroll upwards. Two more RUNs make the screen very messy. Now LIST and retype line 110 without its REM keyword. Type MODE 1 and RUN directly and observe the result. The text scrolls but the triangle stays where it is. Further RUNs do not affect the position of the triangle, because the WINDOW statement of line 110, now active, has confined the text to the left-hand side of the screen. CLS, acting on the window, will clear the text but not the graphics. CLG will clear the graphics screen, which covers the whole screen so the triangle and the text will both disappear.

Listing 1

```
100 REM LISTING 1 (P1L1)
110 REM WINDOW 1,20,1,25
120 LOCATE 1,24
130 ORIGIN 400,200
140 TAG:PRINT "0,0";:TAGOFF
150 PLOT 0,0
160 PRINT XPOS;YPOS
170 DRAW 100,100
180 PRINT XPOS;YPOS
190 DRAWR 0,-200
200 PRINT XPOS;YPOS
210 DRAW -50,-50
220 PRINT XPOS;YPOS
230 STOP
```

If you want the graphics screen to be a different colour from the standard blue background, then CLG 3 will set the graphics paper to ink number three, which is normally red. In fact, you can think of the graphics screen as yet another window. It has no channel number attached to it, and it is permanently set to full-screen size. How then, do you push the graphics into just one part of the screen? Normally, the base coordinates of the graphics screen are X=0, Y=0, fixed to the bottom pixel on the left-hand side of the screen. The triangle on the right of the screen is occupying pixel positions in the X=450 Y=250 area of the screen, yet the printed reports given by XPOS and YPOS are much lower figures. What has happened is that the program has set a new base for the graphics screen. Line 130 really means 'Take postion 400,200 of the whole screen and make it position 0,0 of a new graphic screen'. All subsequent PLOTs, MOVEs and DRAWs take place with reference to the new origin. With coordinates 0,0 in their new position, it is possible to plot using minus X and minus Y values, as the program illustrates, but positive values keep the graphics over in the right-hand side of the screen.

Window Design

Listing 2 is a Basic program which demonstrates the way in which windows can be used to enhance a screen display. Figure 1 is the screen dump of the program which illustrates the GEM-like qualities which can be achieved even on the MODE 1 Amstrad screen. For the record, WINDOW 0 is the whole screen, WINDOWS 1 to 4 are the four shadow-outline boxes, WINDOW 6 is the 'Hello World' box, WINDOW 5 is, by design, invisible and carries the INPUT prompts. The remaining window is 7 which carries the headings of the 'pull-down' menus. The program is a demonstration only, but is nevertheless instructive. The information for the eight windows is carried in the DATA statements of lines 1380-1450 and is later transferred to an array and also the variable W,E,N and S. The relationship for window 0 is shown here:

```
1380 DATA
2 : z(1) : Paper is ink 2
1 : z(2) : Pen is ink 1
1 : z(3) : W : west edge col.1
40 : z(4) : E : east edge col.40
1 : z(5) : N : north edge row 1
25: z(6) : S : south edge row 25
```

The border colour, ink colours and heights of the window at the top of the screen (which carries the names of the pull-down menus) all find their way into the Z(n) array which carries a total of 54 pieces of information. If you don't want to type in the whole program, you might like to try the key subroutine at lines 1120 - 1340 and 1520 - 1630. The former routine places the window (and its shadow) on the screen, while the latter forms the special symbols required for the shadowing, and the symbols needed for the large arrow ICON and the hand ICON. The few lines of Basic needed to run the two subroutines are as follows:

```
10 GOSUB 1520
12 INK 0,1:INK 1,24:PAPER 0:PEN 1
14 MODE 1:DIM Z(55):Z(54)=0:P=0
15 LOCATE 1,1:PRINT SPACE$ (24)
16 PRINT SPACE$(24):LOCATE 1,1
17 INPUT #W,E,N,S,-;W,E,N,S
20 IF E=40 OR S=25 THEN GOTO 15
22 GOSUB 1130:GOTO 15
```

Listing 2

```
100 REM LISTING 2
110 REM WINDOWING DEMONSTRATION
112 REM P1L2
120 GOSUB 390:REM INITIALISE EVERYTHING
130 :
140 REM DEMO PROGRAM STARTS HERE
150 :
160 M(2)=Z(44):M(3)=Z(44):M(4)=Z(44):M(1
    )=2:GOSUB 650:B=1:GOSUB 720
170 INPUT #5," WHAT NOW";X$
180 IF X$="R" OR X$="r" THEN GOTO 250
190 IF X$="B" OR X$="b" THEN WINDOW 1,40
    ,1,25:INK 0,1:PAPER 0:INK 1,24:PEN 1
    :CLS:STOP
200 IF X$="C" THEN |COPY,2:GOTO 160
210 B=4:M(B)=2:GOSUB 650:GOSUB 980
220 INPUT #5," PRESS ENTER";X$
230 GOTO 160
240 :
250 M(1)=Z(44):M(2)=Z(44):M(3)=Z(44):M(4
    )=Z(44)
260 B=3:M(3)=2:GOSUB 650:GOSUB 900
270 INPUT #5," WHICH MENU";B
280 M(1)=Z(44):M(2)=Z(44):M(3)=Z(44):M(4
    )=Z(44)
290 M(B)=2:GOSUB 650
300 IF B=1 THEN GOTO 160
310 IF B=2 THEN GOSUB 820
320 IF B=3 THEN GOSUB 900
330 IF B=4 THEN GOSUB 980:GOTO 220
340 IF B=6 THEN GOSUB 1050
350 GOTO 160
360 :
370 REM END OF DEMO PROGRAM
380 :
390 MODE 1
400 REM READ SELECTED WINDOW DATA
410 RESTORE 1380
420 DIM Z(55)
430 FOR N=1 TO 54
440 READ S:Z(N)=S:NEXT
450 INK 0,Z(50):INK 1,Z(51):INK 2,Z(52):
    INK 3,Z(53)
460 BORDER Z(49)
470 A$="     MENU "
480 B$=" 2:MENU2  "
490 C$=" 3:MENU3  "
500 D$=" 4:MENU4  "
510 GOSUB 1530
520 WINDOW Z(3),Z(4),Z(5),Z(6):PEN Z(2):
    PAPER Z(1):CLS
530 WINDOW #6,Z(39),Z(40),Z(41),Z(42)
540 WINDOW #5,Z(33),Z(34),Z(35),Z(36)
550 PAPER #5,Z(31):PEN #5,Z(32):CLS #5
560 WINDOW #7,Z(45),Z(46),Z(47),Z(48)
570 M(1)=Z(44):M(2)=Z(44):M(3)=Z(44):M(4
    )=Z(44):GOSUB 650
580 B=4:GOSUB 980:B=3:GOSUB 900:B=2:GOSU
    B 820:B=6:GOSUB 1050
590 RETURN
600 REM END OF INITIALISATION
610 :
620 :
630 REM WINDOWING SUBROUTINES
640 REM SET TOP WINDOW COLOUR NORMAL OR
    HIGHLIGHT
650 PAPER #7,Z(43):PEN #7,M(1):PRINT #7,
    A$;
660 PEN #7,M(2):PRINT #7,B$;
670 PEN #7,M(3):PRINT #7,C$;
680 PEN #7,M(4):PRINT #7,D$;
690 RETURN
700 :
710 REM DRAW WINDOW 1
720 W=Z(9):E=Z(10):N=Z(11):S=Z(12):P=Z(7
    ):GOSUB 1130
730 REM PRINTED PROMPTS
740 LOCATE #1,2,2:PRINT #1,"L LOAD":PRIN
    T #1
750 PRINT #1," S SAVE":PRINT #1
760 PRINT #1," B BASIC":PRINT #1
770 PRINT #1," R RUN":PRINT #1
780 PRINT #1," Press ";CHR$(250);CHR$(25
    1):PRINT #1:PRINT #1," L,S,B,or R "
790 RETURN
800 :
810 REM DRAW WINDOW 2
820 W=Z(15):E=Z(16):N=Z(17):S=Z(18):P=Z(
    13):GOSUB 1130
830 REM SCROLLING PATTERNS
840 FOR C=1 TO 8
850 FOR A=211 TO 255
860 PRINT #2,CHR$(A);:NEXT:NEXT
870 RETURN
880 :
```

```
890 REM DRAW WINDOW 3
900 W=Z(21):E=Z(22):N=Z(23):S=Z(24):P=Z(19):GOSUB 1130
910 REM PRINTED PROMPTS
920 PRINT #3:PRINT #3," PRESS ";CHR$(244);CHR$(245)
930 PRINT #3,"          ";CHR$(247)
940 PRINT #3," A NUMBER    1,2,3,4,6"
950 RETURN
960 :
970 REM DRAW WINDOW 4
980 W=Z(27):E=Z(28):N=Z(29):S=Z(30):P=Z(25):GOSUB 1130
990 REM PRINTED PROMPTS
1000 PRINT #4:PRINT #4," SORRY, BUT  ONLY <RUN>  IS WORKING  ON THIS     DEMO":PRINT #4
1010 PRINT #4," PRESS":PRINT #4," <ENTER>"
1020 RETURN
1030 :
1040 REM DRAW LARGE COLOUR WINDOW (#6)
1050 W=Z(39):E=Z(40):N=Z(41):S=Z(42):P=Z(37):GOSUB 1130
1060 REM FILL WITH TEXT
1070 FOR A=1 TO 57
1080 PRINT #6,"HELLOWORLD";:NEXT A
1090 RETURN
1100 :
1110 REM WINDOW SHADOWING ROUTINE
1120 REM FIRST CREATE WINDOW SIZE,PAPER INK &PEN INK
1130 WINDOW #B,W,E,N,S:PEN #B,0:PAPER #B,P:CLS #B
1140 REM NOW CREATE BOTTOM & RIGHT SHADOWS
1150 LOCATE W,S+1:PRINT CHR$(248);
1160 FOR P=W+1 TO E:PRINT CHR$(131);:NEXT
1170 PRINT CHR$(129);
1180 LOCATE E+1,N:PRINT CHR$(249);
1190 FOR P=N+1 TO S
1200 LOCATE E+1,P:PRINT CHR$(133);:NEXT
1210 REM CREATE LEFT SIDE UNLESS AGAINST LEFT OF SCREEN
1220 IF W<2 THEN GOTO 1270
1230 FOR P=N TO S
1240 LOCATE W-1,P:PRINT CHR$(254);:NEXT
1250 LOCATE W-1,S+1:PRINT " ";
1260 REM CREATE TOP SIDE UNLESS AGAINST TOP OF SCREEN
1270 IF N<2+Z(54) THEN RETURN
1280 LOCATE W,N-1
1290 FOR P=W TO E:PRINT CHR$(253);:NEXT
1300 PRINT " ";
1310 REM FINISH OFF
1320 IF W<2 THEN RETURN
1330 LOCATE W-1,N-1:PRINT CHR$(252);
1340 RETURN
1350 :
1360 REM WINDOW & COLOUR DATA
1370 REM PAPER/PEN/W/E/N/S
1380 DATA 2,1,1,40,1,25
1390 DATA 2,0,2,13,3,15
1400 DATA 2,0,11,22,5,17
1410 DATA 2,0,19,30,7,19
```

```
1420 DATA 2,0,28,39,9,21
1430 DATA 2,1,1,40,24,25
1440 DATA 3,0,6,35,4,22
1450 DATA 0,1,1,40,1,1
1460 REM BORDER COLOUR
1470 DATA 13
1480 REM THE 4 INK COLOURS
1490 DATA 0,13,25,22
1500 REM HEIGHT OF TOP BOX
1510 DATA 1
1520 REM SYMBOL DATA
1525 SYMBOL AFTER 244
1530 SYMBOL 244,0,1,127,127,0,3,0,0
1540 SYMBOL 245,0,255,255,255,15,255,15,255
1550 SYMBOL 247,15,127,0,0,0,0,0,0
1560 SYMBOL 248,&FF,&7F,&3F,&1F,0,0,0,0
1570 SYMBOL 249,&80,&C0,&E0,&F0,&F0,&F0,&F0,&F0
1580 SYMBOL 250,24,56,127,255,127,56,24,0
1590 SYMBOL 251,15,31,254,252,254,31,15,0
1600 SYMBOL 252,0,0,0,0,0,0,0,1
1610 SYMBOL 253,0,0,0,0,0,0,0,&FF
1620 SYMBOL 254,1,1,1,1,1,1,1,1
1630 RETURN
```

The Real Screen

The real screen is a block of memory residing in one-quarter of the Amstrad's 64K of RAM, and it is actually known as the screen memory. When the Z80 CPU isn't looking (or at least not looking at this particular block of memory), another chip called the VDU controller sends the information in the screen memory to yet another large chip called a Gate Array (where it is mixed with colour-palette information) and hence out to the green or colour monitor. A computer needs one bit of computer memory to store one pixel of VDU image, and more than one bit may be necessary to encode the colour of that pixel.

The first consideration must be to find out how many pixels the Amstrad is capable of showing, and then to see how they correspond to the screen memory. Just as it was easier to deal with Basic windows in MODE 1, so it is easier to explain the real screen with reference to MODE 2, the high resolution mode. In this mode, the screen can display a maximum of 80*25 characters. Each character is made up from 64 pixels so there are 80*25*64 or 128,000 pixels on the screen. Don't at this stage, worry that the graph-paper of the graphics screen appears to have twice as many pixels (640*400 = 256,000): it hasn't. From here on things get a little complicated: 16K of screen memory represents 16*1024*8 bits of information which is 131,076. The spare capacity of approximately 3076 (a few hundred bytes) is in fact not used at all and can be thought of as being in limbo just beyond the edges of the screen.

In MODE 2, a plotted point is represented by a memory bit set to 1 and an unplotted point a memory bit set to 0. A character is screened as an 8*8 matrix of points containing an assortment of 1s and 0s. The 1s take on the pen ink colour and the 0s take on the paper ink colour. Previous commands, stored in the gate array determine which two colours are assigned to the INKS, and only two different colours can be on screen at the same time. Identical colours cause all points

Gemini

SERIOUS SOFTWARE FOR THE AMSTRAD 464/664

The Cash Book Accounting programs described below are designed for the small to medium sized business, whether a sole trader, partnership or limited company. All need an Amstrad 464 or 664, an 80 or 132 column printer and cassette or disk storage.

Each program has been specially written to use the computer's huge memory and is a 'stand alone' program. However, the Cash Book and Final Accounts programs also interface to produce a superb combination pack for really serious business users, as well as practising accountants.

Each program is supported by a comprehensive, easily followed manual, and 'user friendly' screen prompts with error trapping routines, which make a specialised knowledge of accountancy unnecessary for the average user. The software is, however, capable of advanced accounting use, and in order to fully appreciate and interpret the Balance Sheet a discussion with your professional adviser or Bank Manager may be advisable.

We confidently recommend these programs to serious commercial owners of the Amstrad, and hope they will enable you to operate your business on a more effective, efficient and profitable basis.

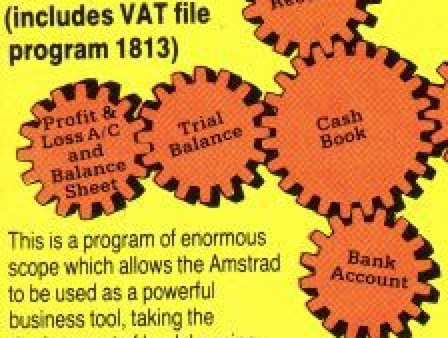
Dale J. Hubbard, Managing Director

Peter S. Meherne MIAP **Software Director**

THE **COMPLETE** CASH BOOK ACCOUNTING SYSTEM

Cash Book

(includes VAT file program 1813)



This is a program of enormous scope which allows the Amstrad to be used as a powerful business tool, taking the drudgery out of book keeping, and producing accurate and comprehensive management information.

In its simplest form the program will replace your Cash and Petty Cash books BUT Gemini's program, in effect, does much more. In addition to recording cash and bank transactions, the program will allow you to enter credit sales and purchases, and for all of these entries it will automatically complete the double entry routines, to ensure that your records are always in balance.

Sales and Purchase ledger control accounts are included, which makes the program ideal for integration with an existing manual sales or purchase ledger system.

The program also includes the following features:

1. Balance at Bank for up to 5 separate Bank Accounts.
2. Petty Cash in hand for up to 3 separate Cash Accounts.
3. A listing of all nominal account titles (maximum 199), most of which are user definable).
4. Monthly transaction summaries and departmental analyses of sales and purchases.
5. VAT memo account balances (sales/net purchases), and VAT accounts.
6. Batch printouts of all transactions entered in current program run.
7. Total debtors and creditors, sales, overheads and Trial Balance.

The program is therefore a complete 'stand alone' accounting software package, ideal for both business users, and practising Chartered Accountants, since an infinite number of different Cash Books may be kept on a single Amstrad.

A full audit trail of all data entered in the program is produced and a journal entry routine is incorporated to facilitate adjustments to individual nominal accounts, prior to producing a final Trial Balance. The latter interfaces automatically with Final Accounts program C.1806, so that a Profit and Loss Account and Balance Sheet can be prepared from data held in the Cash Book program.

Cassette C.1805 £59.95
Disk D.1805 £64.95

VAT File

Whilst this program will benefit most VAT registered businesses, it is also designed for those users who are on one of the special retailers schemes for VAT, which requires them to analyse their expenditure invoices over the various rates of VAT, in order to calculate their VAT output tax. The program will provide the following:

1. A means of recording invoices.
2. A printed copy of all invoice details.
3. Accumulated totals of different types of transactions.
4. The facility for coping with a multi-rated VAT system.
5. Information needed for the preparation of VAT returns.
6. The facility to sort and print transactions by date, invoice reference or customer/supplier name.

The package is capable of dealing with up to 140 transactions in a single batch and the different transaction types are processed in separate batches, which are then printed out as a permanent record. Cumulative totals for gross takings, VAT at standard rate etc. are stored in a data file on disk or tape which can be loaded at the start of every session to provide 'brought forward' totals for the program.

Cassette C.1813 £19.95
Disk D.1813 £25.95

Final Accounts

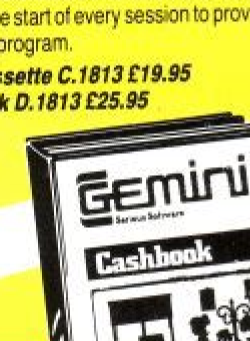
This program is designed to produce a Trading and Profit & Loss Account and Balance Sheet, either from the final Trial Balance produced by Cash Book program 1805 or from any other Trial Balance making it a truly stand alone 'Final Accounts' program.

The facility to produce these documents quickly, accurately, and regularly is of enormous help in running any business, large or small, since one shows the true profitability achieved, and the other the exact strength of the business in terms of assets and liabilities.

The program also allows insertion of budget or comparative figures which can be shown alongside the actual figures, together with notes to the accounts, and the opening Trial Balance for the following period.

Whether used by businessmen or practising Accountants, this program allows the Amstrad to be used as a real business computer producing vital information for decision makers with enormous ease and accuracy.

Cassette C.1806 £59.95
Disk D.1806 £64.95



Bona fide dealers, distributors and overseas licensees for Gemini software always required. Educational establishments contact us for details of our fuss-free licensing agreements.

Combination Packs

Designed to offer maximum value and convenience to serious business users, by combining several programs in one handy pack, together with their appropriate manuals.

Contains: Cash Book (including VAT file) and Final Accounts.

	Normal List Price of Programs in Pack	Combination Pack Price	Saving
C.1818 Cassette	£119.90	£89.95	£29.95
D.1818 Disk	£129.90	£99.95	£29.95

BEAUTIFULLY PACKAGED AND DOCUMENTED, THESE EXCEPTIONAL PROGRAMS PROMISE TO BECOME 'BEST SELLERS' FOR ALL AMSTRAD STOCKISTS, AND ARE CONFIDENTLY RECOMMENDED AS 'STATE OF THE ART' SOFTWARE FOR THIS POPULAR, COMPETITIVE HOME MICRO.

Database Management System

Unleash the data storage capabilities of your Amstrad with this powerful database program from Gemini, the market leaders in home computer software!

Your Gemini Database will allow you to store, retrieve and manipulate data in a variety of useful ways — just as you would with a manual card index system, but with extra capabilities, such as:

- Set up your own user-definable card layout in 40 or 80 column mode.
- Up to 20 fields allowed, each with 160 characters — to a maximum of 1000 characters per card. Up to 999 records available, making full use of the 464/664's memory capacity.
- Extensive mathematical and field relational expressions may be used, including totals and averages.
- Quickly sorts alphabetically or numerically, even names by surname if required, with or without case discrimination. Sorts may be performed on subsets of records on ANY field.
- Integrates with Report Generator (available separately) to produce standard mail-merged form letters, mailing labels up to 3 across page etc.
- Change record format at any time, add or delete fields after set-up.
- Completely user-definable field summaries available to both screen and printer — 40 or 80 column display mode.
- Delete records.
- Browse with instant edit/print/delete options.
- Simple menu-driven operation.
- Utilises machine code routines — no long 'garbage collection'.
- Files may be merged enabling the appending of files without tedious re-typing.
- Superbly documented in an easy to understand style — just as you would expect from Gemini!
- Comes with two documented demonstration files to show the extensive capabilities of the software.

Cassette C.1801 £19.95
Disk D.1801 £25.95

Report Generator

Requires Gemini Database Program No. C.1801 and Printer

This program will allow you to present and print your Gemini Database data in formats that you design yourself on-screen.

Look at some of the ways in which you can use it:

- Re-arrange your record layout to meet specific printed requirements.
- Create sets of mailing list labels from database records, up to three across your printer.
- Create documents inserting merged fields into text, just like the expensive word-processors!
- Design field summaries for columnar presentation of data, and total any given column.
- Ideal for mail-merged standard letters.
- Create any number of standard documents from one database file.
- Will even right-justify documents, automatically adjusting for variable length merged data.

Technical Details

RECORD MODE: 1600 characters of text available, including field data. Headers and Footers may be entered when using printer paging options.

MAILING LABEL MODE: 1-3 labels across page, with automatic compacting of lines to sequence the printer.

DOCUMENT GENERATOR MODE: 3200 characters available per document, with merging of up to 20 fields in any position on document. Any field may be used more than once. Automatic justification.

FIELD SUMMARY MODE: Up to 20 fields may be specified, maximum of 160 characters each.

Cassette C.1820 £19.95
Disk D.1820 £25.95

Home Accounts

The Gemini Amstrad Home Accounts is a suite of two programs offering comprehensive management of home finances. It is quick and easy to use and includes the following main features:

- Computer aided budget design.
- Up to 30 expenditure allocations.
- Financial year may start with any month.
- Amendments to budget at any time.
- Up to 24 characters per transaction.
- Automatic warning if bank charges likely.
- Forecasting of balances and expenses.
- Bar charts of budget/actual income/expenditure.
- Various printer routines.
- Powerful search routines including:
  Date, or range of dates
  Allocations
  Transaction details (specific name)
  Credits
  Combinations
- Simple to check account totals and running totals against budget at any time.
- All account entries sorted into date order if required.
- Simple amendment or deletion of entries.
- Date entry validation.
- Full summary by allocation.
- Four types of monthly summary.
- Automatic entry of standing orders.
- Plus more...!

Cassette C.1807 £19.95
Disk D.1807 £25.95

Gemini

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Jones of Plymouth
TRADING AND PROFIT/LOSS ACCOUNT FOR THE 12 MONTHS ENDED 12/12/84

Jones of Plymouth
NOTES TO THE BALANCE SHEET AT 12/12/84

BALANCE SHEET AT 12/12/84

NOTES TO THE TRADING AND PROFIT/LOSS ACCOUNT

Express 24 hour credit card orders (Amex, Access) **0395 265165** immediate guaranteed despatch

Ref.	Item	Cass/Disk	£ each	Total
1805	Cash Book			
1813	VAT File			
1806	Final Accounts			
1818	Combination Pack			
1801	Database			
1820	Report Generator			
1807	Home Accounts			

Cheque/P.O. enclosed £ .... Total ....
Or charge my Amex/Access No. .... Signature ....
Name ....
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Prices include VAT and post and packing

to be invisible - an interesting situation which frequently occurs when MODE 2 is entered after certain colour combinations have been set in MODE 0 or MODE 1.

The screen memory runs from &C000 to &FFFF, and it can be POKED from Basic. It can also be PEEKED from Basic, despite the fact that a ROM also occupies the same part of the computer's memory. Locomotive Basic is clever enough to assume that if you ask it to read an address above &BFFF, it's the screen memory RAM contents you're interested in and not the ROM contents.

Type in direct mode, CLS:POKE &C000,&FF and a small dash will appear in the top left-hand corner of the screen. The first blow to sanity is the fact that the screen memory moves about. It's always at &C000 to &FFFF, but &C000 is not always the first byte of the screen. Whenever a whole screen scrolls, a fast 'hard scroll' routine is used and screen addresses change, which is disconcerting to say the least. POKE &C000,&FF will probably place the dash in the middle of the screen. However, when windows which are less than full-screen size scroll, a slower 'soft scroll' routine is used and the screen memory addresses are not scrambled.

The third program this month allows you to poke the screen memory in various safe ways to see how the addresses are arranged, how a byte appears when it is placed directly into the screen memory, and how the same bytes created different effects when the screen mode is changed. Windowing is used to form a menu-driven program and to inhibit the hard-scrolls.

Listing 3

```
49 REM LISTING THREE
50 REM SCREEN INVESTIGATOR
52 REM P1L3
100 INK 0,1:PAPER 0:INK 1,24:INK 2,20:INK 3,6:PEN 1:CLS:BORDER 9
110 INPUT "MODE ";M:MODE M
120 PLOT 36,376:DRAWR 508,0:DRAWR 0,-64:DRAWR -508,0:DRAWR 0,64
130 PLOT 552,376:DRAWR 80,0:DRAWR 0,-64:DRAWR -80,0:DRAWR 0,64
140 PLOT 36,296:DRAWR 596,0:DRAWR 0,-272:DRAWR -596,0:DRAWR 0,272
150 IF M=0 THEN L=3:R=19:RR=16
160 IF M=1 THEN L=4:R=39:RR=33
170 IF M=2 THEN L=6:R=77:RR=67
180 WINDOW L,R,8,23
190 A=&C000+&138
200 WINDOW #1,L,RR,3,5
210 REM ----------------------
220 CLS:PRINT " MENU"
230 PRINT:PRINT "1. BOX - AUTO"
240 PRINT "2. BOX - MANUAL"
250 PRINT "3. WHOLE SCREEN"
260 PRINT "4. NEW MODE"
270 PRINT "5. CLS"
280 PRINT "6. BASIC":PRINT
290 INPUT RP:IF RP<1 OR RP>6 THEN GOTO 220
300 CLS:CLS #1:IF RP=1 THEN GOTO 370
310 IF RP=2 THEN GOTO 460
320 IF RP=3 THEN GOTO 510
330 IF RP=4 THEN GOTO 100
340 IF RP=5 THEN MODE M:GOTO 120
350 IF RP=6 THEN MODE 1:STOP
360 REM ----------------------
370 LOCATE #1,1,3:PRINT #1,"AUTO";
380 INPUT "STEP ";S:IF S=0 THEN GOTO 380
390 IF S>99 THEN GOTO 380
400 FOR H=0 TO &FF STEP S
410 GOSUB 630
420 IF S>2 THEN INPUT X$
430 NEXT H
440 GOTO 220
450 REM ----------------------
460 LOCATE #1,1,3:PRINT #1,"&X INPUT";
470 INPUT "&X ";H
480 IF H>&FF THEN GOTO 220
490 GOSUB 630:GOTO 470
500 REM ----------------------
510 CLS #1:LOCATE #1,1,1:PRINT #1,"ADDR IS C000";
520 LOCATE #1,1,3:PRINT #1,"INC BY ";
530 CLS:INPUT "INCREMENT ";INC:PRINT #1,HEX$(INC,4);
540 INPUT "HOW MANY ";AM
550 AD=49152:NUM=0
560 POKE AD,&C0:LOCATE #1,9,1:PRINT #1,HEX$(AD,4);
570 NUM=NUM+1:IF NUM>AM THEN GOTO 600
580 AD=AD+INC:IF AD>49151 AND AD<65536 THEN GOTO 560
590 PRINT "THE NEXT POKE WOULD BE OUT OF RANGE":GOTO 610
600 PRINT "ALL DONE":GOTO 610
610 PRINT "PRESS <ENTER>":INPUT X$:GOTO 220
620 REM POKE S/R ------------------
630 PRINT H;" ";HEX$(H,2)
640 LOCATE #1,1,1:PRINT #1,H;" ";HEX$(H,2);"H  ";BIN$(H,8)
650 POKE A,H
660 X=A+4
670 FOR Y=1 TO 8
680 POKE X,H
690 X=X+&800:NEXT
700 RETURN
```

When the program is started, you are invited to choose a screen mode and you should choose 2 for the first run since it gives a very clear demonstration, especially on green monitors. The display menu is printed in one of them. Options 4, 5 and 6 merely change screen modes, clear the screen and exit to Basic, but options 1, 2 and 3 allow the screen to be investigated.

1.BOX - AUTO:

A number, starting with zero, is incremented in steps of your choice until 255 is reached, whereupon the routine stops. Each number is POKED directly into the screen memory so you can observe the effect it has on the screen display. When you choose this option, you are first invited to enter a stepping value. Type 32 then ‹ENTER›, ‹ENTER›. The program will increment a byte from 0 to 255 in steps of 32 and POKE the value onto the screen. The two 'enters' cause a window above the menu to display '0 00H 00000000' and then '32 20 H00100000'. In a third, square, window the effect of the poke can be seen both as a single byte and as a stack of 8 contiguous vertical bytes of the same value. Pressing ‹ENTER› continues the process. Being mode 2, there is of course a direct comparison between the binary representation of the byte and the bar which is poked into the square window.

If the step value entered is 1, then all 256 bytes will be poked to the screen. This is done by the program so you need not press ‹ENTER› 256 times. It takes 50 seconds to go through all 256 combinations.

2. BOX - MANUAL:

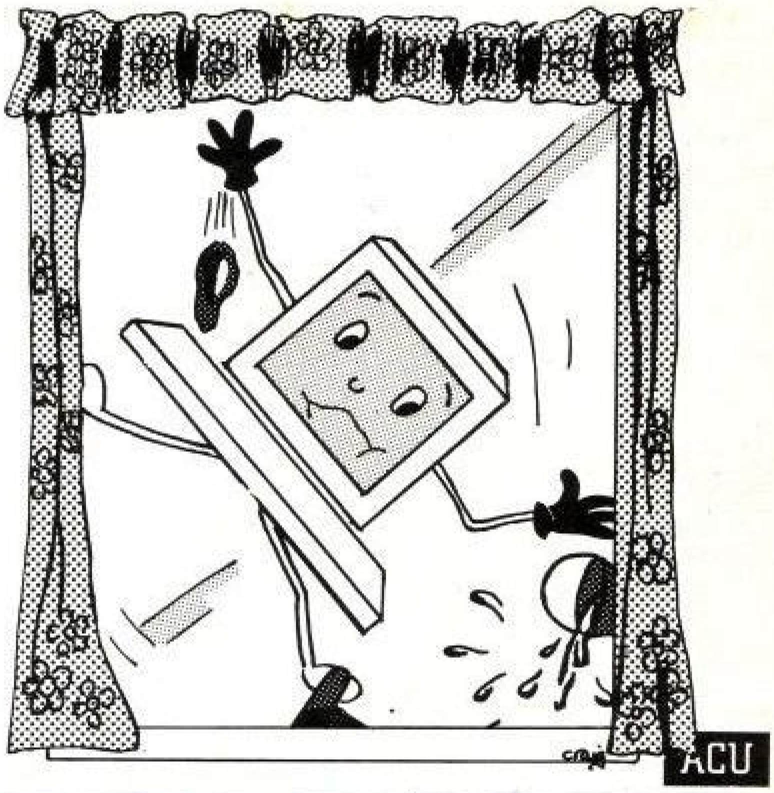
This option invites you to enter a number of your choice which is then POKED on the screen in the same way as in option one. For example, entering any one of the number types 255, &FF or &X11111111 produces a bar (all 8 pixels illuminated) in the square window. Entering any number greater than 255 will take you back to the menu.

3. WHOLE SCREEN:

This option POKES values to various addresses all over the screen and does not confine its activities to the square window. At the start of the routine 'ADDR IS C000' is written in the top window and an input prompt 'INCREMENT?' is placed in the main window. Sixteen is a suitable increment to start with so type 16 ‹ENTER›. The prompt 'HOW MANY?' appears next because the program is about to make a series of pokes to address &C000 and every sixteenth address after &C000 and it wants to know the total number of pokes it should make before stopping. 100 is sufficient and 100 ‹ENTER› will start the process. Error trapping prevents any poke going to non-screen addresses, so you can play around with this option and try to work out how the screen memory addresses are laid out. When the screen gets too messy, use option 5 and start again.

In these three routines you will find that the results obtained in screen modes 0 and 1 are different from those obtained in MODE 2, but that by staying in MODE 2 it is possible to work out the address-structure, or memory-map, of the screen display.

Next month the screen memory map will be revealed (it is misprinted in the CPC464 Firmware Manual so don't cheat and look it up). Modes and colour will be discussed and a start will be made on some short machine-code routines.



TIME FOR

Simon Rockman looks to see what makes the new Citizen MSP-10 tick.

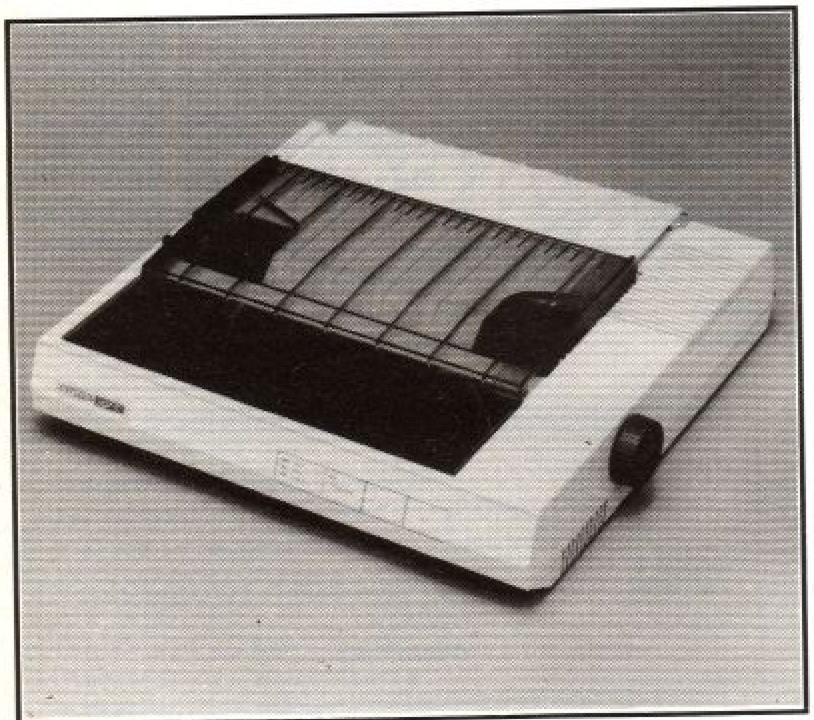
The general consensus amongst computer dealers is that the printer market is becoming overcrowded. Not long ago Epson were the only major printer manufacturer. Now rivals are catching up on the premise of "If you can't beat 'em join 'em". The Epson compatible market is growing rapidly, new printers have to offer something special. Citizen, the established Japanese watch manufacturer have launched a four pronged attack on the printer market. The cheapest model is the MSP-10.

Appearance

The MSP-10 is one of the nicest looking printers I have seen, the footprint is much squarer than that of its rivals (37 cm wide by 33 cm deep) but what really makes the thing look classy is the height. The new Citizen is only 8cm high. One of the trickiest things to do when setting the printer up is working out which piece of plastic fits where. The lid is in three parts, one to provide a tear bar, one to stop the incomming paper snarling up against output and one to keep all the noise down. The front mounted switches control line feed, paper feed and switch the printer on or off line.

Despite being quite light the MSP-10 feels well made, all the bits of plastic fit snugly and paper is easy to feed in. Either tractor or friction feed paper can be used, although you do need to be careful with high quality single sheet stationary because the bail bar does not come far enough forward to avoid snagging.

Inside the MSP-10 is just as neat. The main PCB is at the back and it is this which makes the printer so long. Printers seem to have more components than computers, there are certainly a lot of chips on the board. There is little chance of you doing any great electrical damage to the printer, there are several fuses inside. The Centronics interface is standard with no apparent provision for RS232. There is a socket on the board for an 8K printer buffer. As standard the machine has a one line buffer. One item I was disappointed to see inside was a bank of dip switches. The MSP-10 may be very easy to take apart but it would be much nicer if the switches could be on the outside, or at least accessable through a hatch, users do change dip switches and printer manufacturers should cater for that.



This is a print sample from the new Citizen MSP-10
This is its Correspondence Quality.
You can mix character widths
You can mix character widths
You can mix character widths
Print can be Expanded
or compressed
Italics and <u>*underlining*</u> *are no problem*
Inverted Print is extra feature
Both subscript and superscript text can be printed
THE MANUAL RECOMMENDS
EXPERIMENTATION

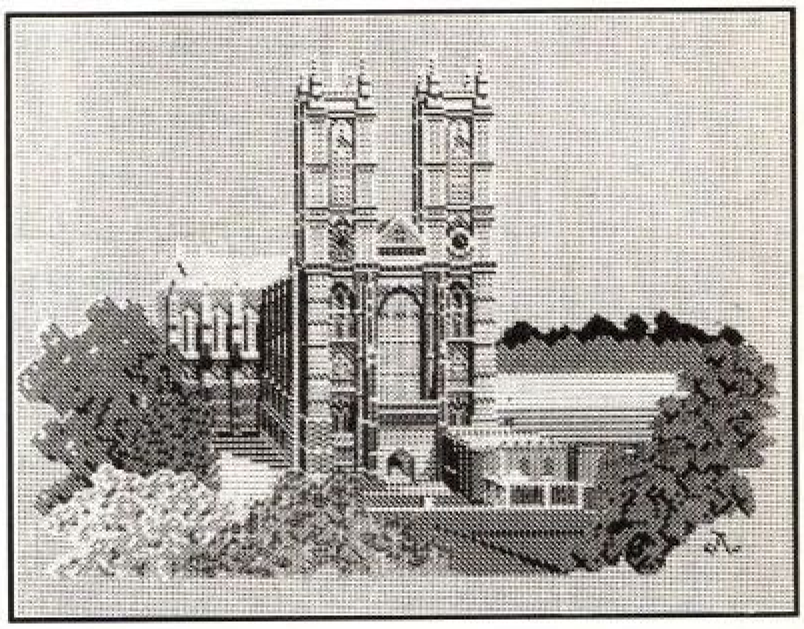
In Use

It is no use having the smartest looking printer in the street if it is not very good at printing. The MSP-10 has no worries here. Hard copy is crisp and workmanlike. Citizen see the new Epson FX85 as being the main opposition. As you will see from the print sample the draft quality is very similar. All our tests indicate that the MSP-10 is fully Epson compatible. The picture of the Abbey was dumped using the program listed in this issue without any modifications. The MSP-10 is pretty fast at 160 characters per second (cps), making it a good listing printer. The speed is particularly noticable if you are used to a DMP-2000 (105 cps) or a similarly rated printer. It is in draft mode that the printer is quietest. The absence of any sound deadening foam means that near letter quality (NLQ) text is pretty noisey inspite of the large quantity of plastic twixt the print head and the outside world.

The bane of the Amstrad printer user is the 7-bit Centronics interface, the MSP-10 offers a cure for this problem. An eighth bit can be obtained by sending an escape sequence. This gives full access to graphics and a set of mathematical symbols.

The paper flow using pin feed is excellent, a large sheet of plastic seperates incomming and out going paper, an exception to the rule "A left printer always jams"

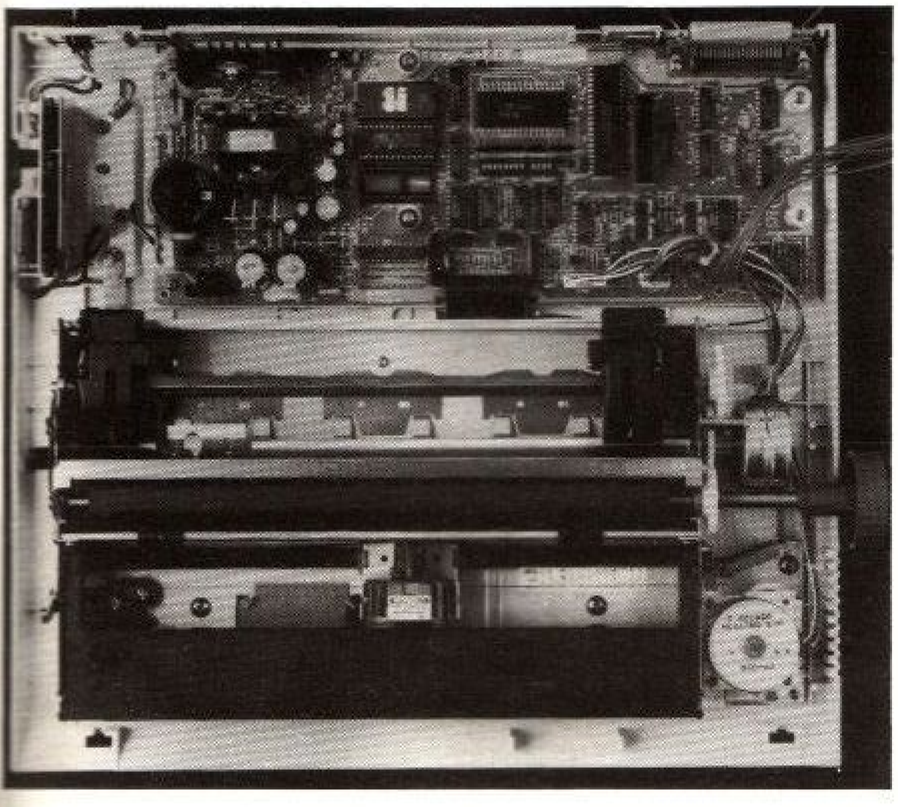
All self-respecting printers now offer NLQ. The Citizen has a very good NLQ mode at a decent speed (40 cps). Letters made up of little dots are now generally acceptable, only the computing fraternity sneer at the user who has not got a daisywheel. Perhaps it is the advent of the dot-matrix typewriter which has meant that dot-matrix output does not necessarily mean computerised and so de-humanising. Citizen call the NLQ "Correspondence" quality, I certainly feel that the title is justified.



Documentation

A good manual makes using (and reviewing) a printer very much easier. The days of crudely translated Japanese

A CHANGE



manuals may be over but many printer manuals can still be very hard to read. Citizen seem to have combined detail without jargon and brevity without skimping. No-one reads a manual from start to finish before plugging a printer in, the manual is always the last resort when you can't do what you want to without looking the information up. This means that you are usually frustrated before you start. Finding a solution to a problem is usually quick and easy. Inevitably there is a lot of cross referencing, however references are only made to the appropriate chapter, since the pages do not have the chapter numbers on them you have to return to the contents to find which page you need.

The style of the manual is plain and informative, there are no Amstrad-specific instructions, but if you follow the information on using the Apple 7-bit interface and read your CPC manual you should be able to work out how to do everything you need to. There are notes on using the printer from CP/M and on how to install WordStar to get the most out of your printer.

The best feature of the manual is a pull-out reference card, this gives a brief summary of all the switch settings and escape codes. If you are really fussy about documentation the technical manual explains in precise detail how to repair the printer. This is available seperately and is only really of use to an engineer.

Conclusion

The Citizen MSP-10 is a good sturdy printer, the best features are the NLQ, paper feed and the documentation. Worst features are noise, internal DIP switches and a bail bar which catches the paper. It is a little pricey but does the job well. If you are buying a printer for home use you may want to shop around for something cheaper and make a few sacrifices in terms of speed and quality. If you are a business or particularly heavy home user the MSP-10 is an excellent buy. Compare it with the Star SG-10, Epson FX-85 and Oki Microline 192.

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*Cannot be used with Modem.

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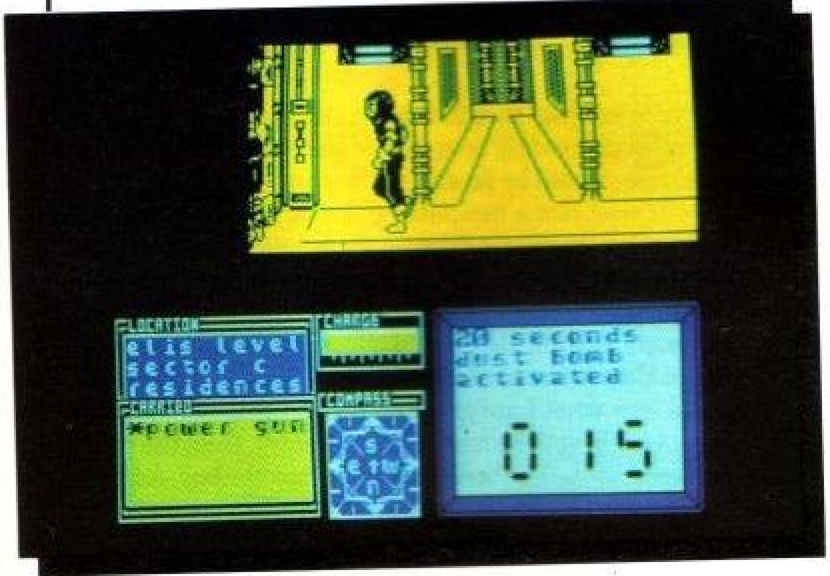
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SOFTWARE REVIEWS

GAME OF THE MONTH

MARSPORT





AUTHOR GARGOYLE GAMES
PRICE £9-95
GRAPHICS 15 FIRST IMPRESSION 12
SOUND 3 LASTING IMPRESSION 19
POLISH 18 VALUE 18
COMMENT EVER GET THE FEELING YOU'RE GOING ROUND IN CIRCLES!

(All scores out of 20)

The year is 2494. Commander John Kepler Marsh has been sent to Marsport, an enemy occupied outpost, abandoned shortly before the Siege of Earth began. There he seeks the plans ofthe force field surrounding the Earth and Moon. If he can find the plans and return to Earth, the force field can be strengthened against the sustained attack of the evil insect-like Sept.

Marsh must make his way through Marsport to M-Central the massive intelligent computer that controls the city. M-Central has been programmed to defend itself against the Sept and it has built many defence systems into the labyrinth of corridors that make up the city. Marsh must avoid these and the Sept if he is to succeed in his mission.

Having loaded Marsport, a menu of options is presented. Selecting 'Enter the Game', the screen displays the first corridor. Also shown is the current list of things carried (nothing), the charge left in the laser pistol (if one is carried), and a blank area on which various reports appear.

The hatch opens and John Marsh steps out. The middle three rows of the keyboard are laid out so that alternate keys have a single function. The bottom row moves Marsh left andright. The middle changes the compass point from which he is displayed. The top picks up or puts down an object. Thereare hatchways that can be entered by pressing ENTER and when Marsh has a laser pistol SPACE will fire it.

As Marsh moves around he passes 'cash points' placed alongthe walls. These are labelled Locker, Supply, Refuse, Herald, etc. They are places where useful objects can be found or useless ones disposed of. Also they house the automated minions of M-Central and give useful clues to solving particular problems. One of the units is called Factor. This can be used to combine two objects to make a single different one. There is one other type of unit called Key and this allows the opening of locked doors and the type of object to place in this unit depends on the area you are trying to gain access to.

Marsport is laid out on ten levels, from Alba level on the planet surface to Joly level deep beneath it. Travel between the various levels is by up and down tubes that whisk the traveller to another floor. The destination of a tube is always consistent and there is no control over the destination. Some tubes allow travel in both directions but others in only one which means that once taken Marsh is committed to exploring the destination floor. The different levels have different functions and this is reflected by the rooms that will be found on that level. There appear to be Sept warriors on most levels and these stay in one place making access to some sections dangerous. A Sept warlord, is an impassable obstruction that cannot be destroyed by laser fire but will not persue you, unlike its little friends. The other dangers that will be encountered are Wardens, robot sentries that protect M-Central from the Sept but cannot distinguish Marsh from an enemy. Also there are bombs and other hazards which must be passed in the search for the plans. Should Marsh be killed he will be returned to the start of the game. If he carries a laser pistol he will keep it, but lose all other objects. The game is not fully reset, objects are left in their current positions, but hazards will need to be renegotiated. The game includes a save game/reload game option and pause feature.

This is an excellent game that will keep someone amused for hours. The graphics and animation are of a very high standard, being similar to the Knightlore/Highway Encounter two colour type, rather than Sorcery multicolour sprite type. The sound is a bit thin but this type of game does not really need amazing sound effects. The sheer size of the city and the problem solving element make this a very challenging game to play and well worth the price.

ON THE RUN

If you ran a software company and had produced two excellent vector graphic style games. What would you do for an encore? Yes, of course, produce a boring old sprite game, its obvious isn't it.

On The Run is not a game about escaping prisoners but about one blobs search for another blob in a maze of blobs inhabited by blobs. Lying within the maze are six blobs containing dangerous chemicals which it is your job to retrieve. You have a limited amount of energy to with stand the assault on your jetsuit from the wicked blobs that zip around the maze. However, you can blast blobs with your laser and it is possible to recoup energy by picking up blobs but remember some blobs will reduce your energy and when you have none left, guess what...You die. Dotted around the maze are smart blobs. When you have picked up one of these you can erase a screenful of blobs with one blow.

Movement in the game is by joystick or keyboard control. You can move left or right, fire the jet and move up, drift down and fire the laser, also set off a smart bomb. As you would expect from Design Design the keyboard is definable.

On The Run has a very fast response to joystick/keyboard input. Too fast, when the jetman sprite is on the border between one section and the next the screen continuously changes between the two. When the joystick is pulled back or down the screen seems to be completely updated producing a very annoying flicker. There are other aspects of the games playability that also leave much to be desired, which is a shame, because it could otherwise have been a very good boring old sprite game.



AUTHOR DESIGN. DESIGN
PRICE £8-95
GRAPHICS 12 FIRST IMPRESSION 7
SOUND 14 LASTING IMPRESSION 8
POLISH 10 VALUE 11
COMMENT DISAPPOINTING FOR DESIGN. DESIGN

THE SECRET DIARY OF ADRIAN MOLE



AUTHOR LEVEL 9/MOSAIC
PRICE £9.95
GRAPHICS 10 FIRST IMPRESSION 18
SOUND 0 LASTING IMPRESSION 12
POLISH 14 VALUE 10
COMMENT SAVE MONEY - BUY THE BOOK!

If you get a good idea you should exploit it. Sue Townsend has mastered the skill of expanding on a simple idea in a way that even Douglas Adams' mice would be proud of. The Diary that launched a thousand spin-offs now has a computer game to add to the books, stage play, TV programme and diaries. Once upon a time if you stopped someone in the street and asked them to name a diarist they would have said "Anne Frank" or 'Sammuel Pepys', not any more, they are bound to say 'Adrian Mole'.

In case Amstrad User is the only contact you have with the outside world and don't know what I am going on about I will explain. Sue Townsend wrote a book, or to be more precise a diary, from the point of view of a boy aged 13 $^3/_4$. The book explained how the boy, Adrian, thinks of himself as an intellectual and keeps sending poems to the BBC. He is in love with a classmate called Pandora, looks after a pensioner called Bert Baxter and his parents marriage is breaking up. In the game you have to take decisions for Adrian and make yourself as popular as possible.

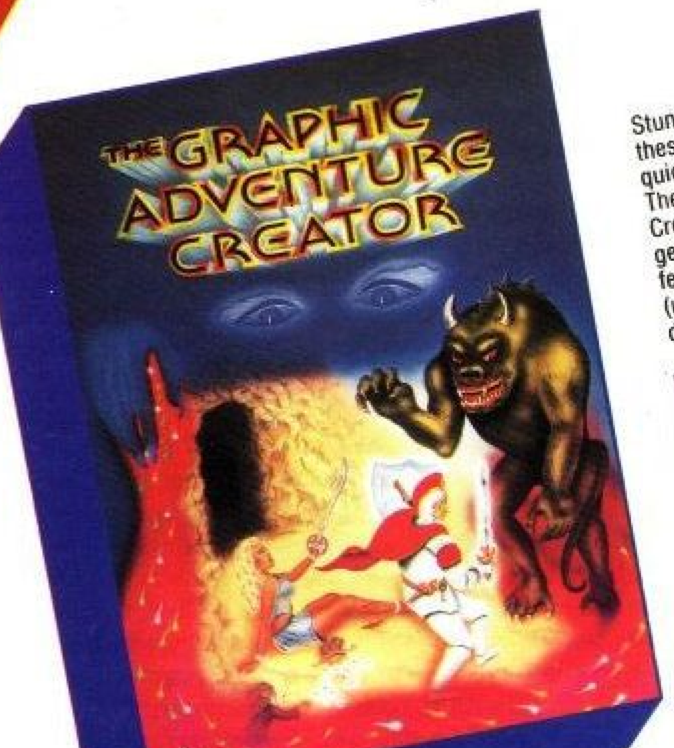
The Secret Diary of Adrian Mole can be loosely described as an adventure. It is more like one of those fighting fantasy books which allows you to make decisons by turning to an appropriate page. Each move is a multiple choice option. At various points in the game you are prompted to press 1,2 or 3. This indicates your choice and produces a suitable piece of text. There is a lot of text in the 'adventure', not even the Austins' famous text compaction routines could cram the whole lot into RAM at one time so the program loads in sections from tape.

It is the tone of the text which makes the program, the game is fun but in a trivial way and I couldn't help feeling that the same end could have been achieved by a book. To some extent I felt that I was being tested on how well I knew the story, a dyed in the wool Adrian Mole fan would probably love that, I got bored. Level 9 have an execellent reputation for fiendish adventures with clever and amusing puzzles, they can and have done much better than this.

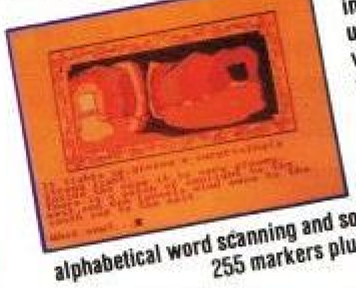
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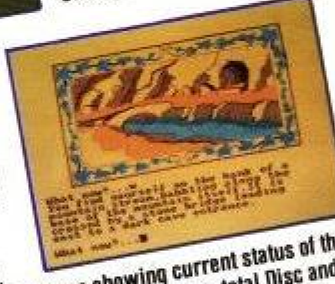
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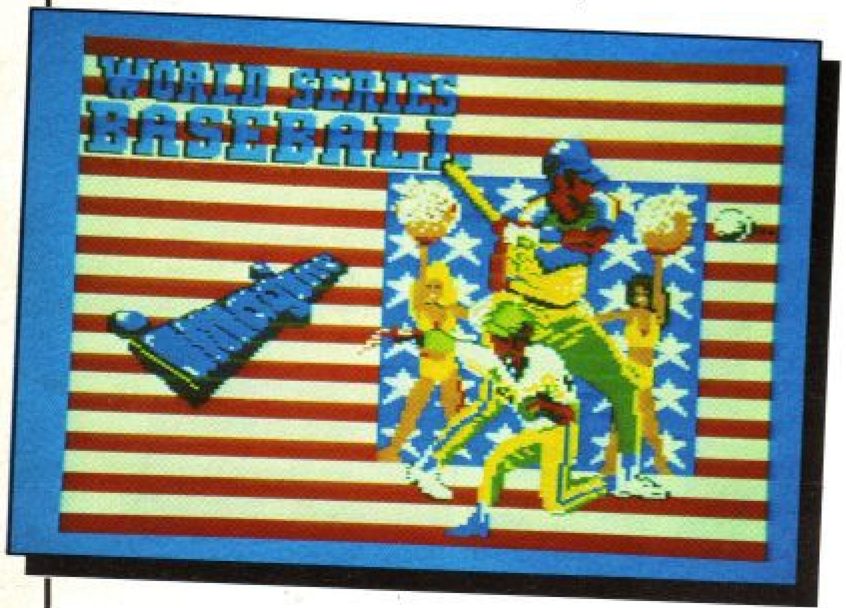
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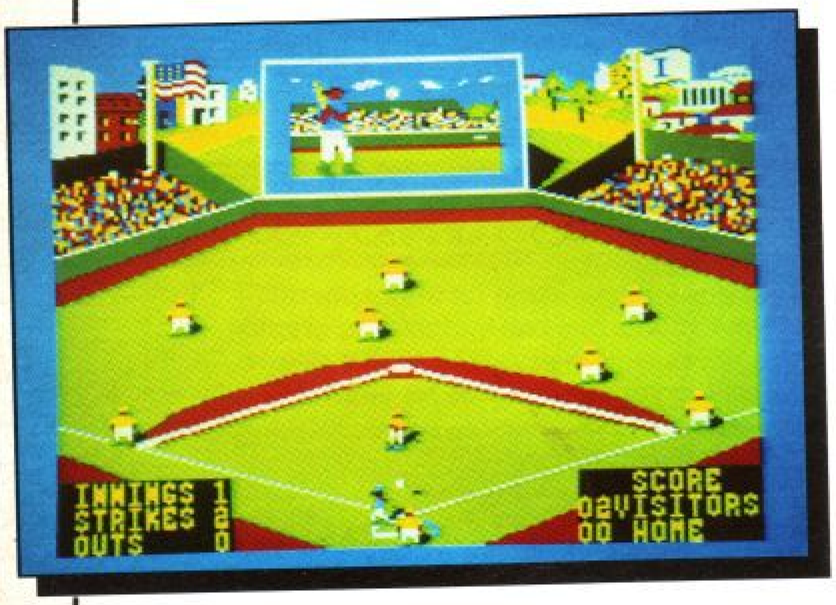
WORLD SERIES BASEBALL

The sporting habits of the Americans have always struck me as a little strange. Their national game is seen in this country as a game for school girls and when they do try to play anything like a mans game they will only do so in full battle armour that would have made many a knight of yore flinch.

Having started out with a very partisan attitude before I played World Series Baseball from Imagine, I have to say that the appeal of the game has certainly grown.

One thing the Americans can do right when it comes to sporting events is pour on the razmatazz and so it is only fitting that a simulation should try to capture their same sense of whole hearted fun. I am pleased to report that WSB does just that. Some spectacular musical renditions of great Sousa favourites, mixed with the overall humour that has been given to this game make it quite eminently playable.





AUTHOR IMAGINE

PRICE £8-95

GRAPHICS 19 FIRST IMPRESSION 15

SOUND 19 LASTING IMPRESSION 17

POLISH 18 VALUE 17

COMMENT KNOCKS ALL OTHER SPORTS SIMULATIONS OUT OF THE BALL PARK!

Cast your mind back to your junior school days when you no doubt had the dubious fun of playing rounders on a Wednesday afternoon and you to can begin to get an idea of just what Baseball is all about. It basically consists of two teams, one of whom bats while the other is fielding. Assuming you actually manage to hit the ball then you'll be up on your toes to the first base. If you have done really well and knocked the ball out of the park then you get all the way round to home base in one go. This is known as a Home Run and is met by the lively rendition of the Washington Post which helps to build the sense of excitement. Any other team members in front of you at the time, being carried along in the general wave of enthusiasm. If you miss the ball (and you're bound to at first, the timing seems quite critical) then you will strike out. Three strikes and you're quite definitely out. Three outs on your side and the current innings for your team ends.

Having had a crack at batting there is then a chance to show your fielding prowess. Before the pitch you decide whether to keep your fielders close in or send them further out for the long ball (to tell you the truth, I don't think this makes very much difference). Having selected the field setting, the bowler is shown atop the pitchers mound on the wide screen TV at the back of the field, a very novel way of allowing you to see both close up detail as well as an overall view of the complete pitch. Various gymnastics with the joystick (almost definitely a must in order to play a sensible game) allow you to pitch the ball at different speeds and heights to try and catch the batsman so that he strikes out. Batting too soon or too late will cause the ball to be fouled which counts as a strike. Always assuming the ball is knocked into the centre of the field, the nearest fielder can run towards it and pick it up. Joystick gymnastics take over again and allow the ball to be thrown to any of the men guarding the four bases with the intention of stumping (well that's what it was called in my formative rounders years) the little guy who is running towards that base.

One of the nice touches of this program is the amount of detail in each frame of animation for all the little men - each one has a convincing shadow that heightens the sense of 3D. You won't have to wait long (the end of the first innings) to see one of the most amusing touches of the game. Once the fielding side have all trouped off the side of the screen, a line of cheer leaders appears and dance up and down to another of those great American classic tunes (that I can't remember the name of). (Baseball does not use cheerleaders but the programmers had written the routines before anyone realised). If you miss them, don't worry too much because they'll be back on at the end of a later innings. Also watch out for the head that pops up with a card saying 'Hello Mom', another amusing feature.

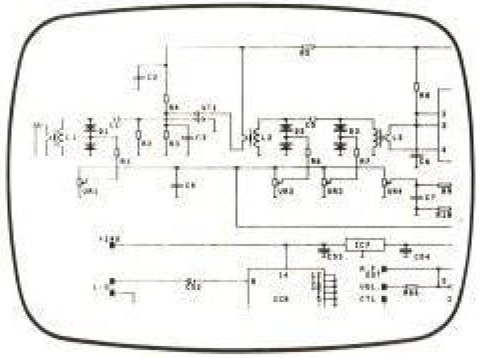
There are several modes of play in the game; Computer versus computer (demonstration mode - that starts up when the game first loads - stopped by [ESC] key), You versus the computer - either joystick or keyboard; I found the computer was a bit of a daunting opponent at my first attempt - it won 68 - 12. You versus an unsuspecting by-passer. This third mode is by far the most entertaining, especially when your opponent is as big a wally as you are (the idea that the computer is in some way "cheating" is obviously not as prevalent).

Of all the sporting simulations (including Kung-fu) that I've seen, this is by far the best. The use of colour (or should that be color) brilliant sound track and un-rivalled humour in the graphics are almost bound to make this a smash hit for Christmas.

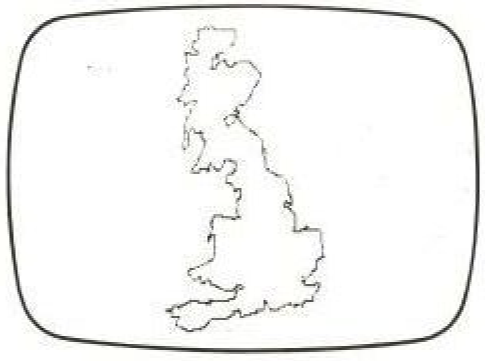
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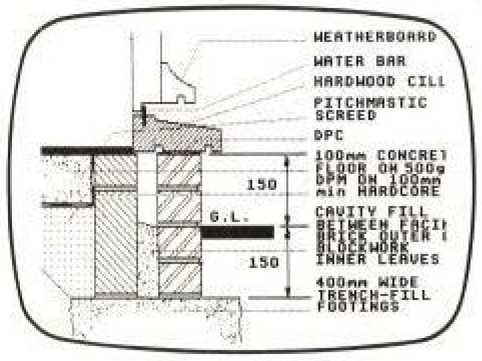
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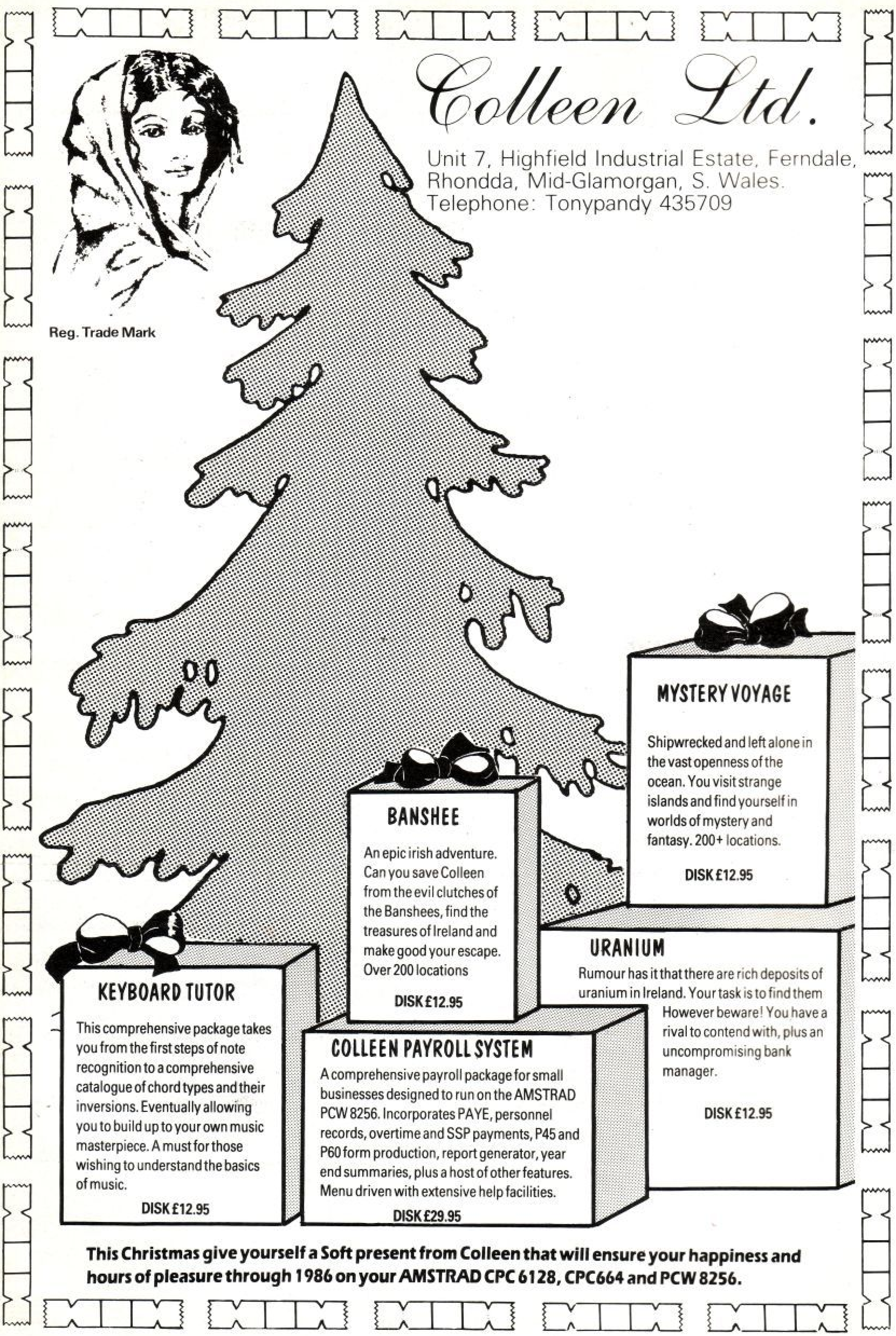
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DISK £29.95
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```
2940 men=men+1:SOUND 1,10,-1,15,5,4:SOUND 2,50,-1,15,5,4:SOUND 4,100,-1,15,5,4
2950 WINDOW SWAP 0,1:PEN 9:mess$=CHR$(230):FOR f=1 TO men:LOCATE f*2+4,4:GOSUB 2440:NEXT:WINDOW SWAP 1,0
2960 FOR f=1 TO 800:BORDER f MOD 6:INK 5,f MOD 6:NEXT:INK 5,b:BORDER b:CLS:GOTO 190
2970 LOCATE 1,18:bo=(CINT(RND*5)*100)+400:mess$="MYSTERY  BONUS ="+STR$(bo):PEN 9:GOSUB 2440
2980 sc=sc+bo:freeman=freeman+10000
2990 FOR f=300 TO 0 STEP -10:FOR g=f TO 11 STEP -10:SOUND 1,g,1,15:SOUND 2,g+f,1,15:NEXT g:bor=RND*20:INK 5,bor:BORDER bor:NEXT f
3000 INK 5,b:BORDER b
3010 TAG#1:PLOT 800,800,2:MOVE 226,70:PRINT#1,sc;:TAGOFF#1:CLS
3020 GOTO 190
3030 GOSUB 2490
3040 PEN 13:PAPER 14:PRINT STRING$(20,246);:LOCATE 1,20:PRINT STRING$(20,246);
3050 FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246):NEXT
3060 LOCATE 5,12:PRINT STRING$(15,246):LOCATE 5,16:PRINT STRING$(15,246)
3070 FOR f=4 TO 11:LOCATE 5,f:PRINT CHR$(246):LOCATE 13,f:PRINT CHR$(246):NEXT
3080 LOCATE 13,2:PRINT CHR$(246):LOCATE 16,7:PRINT STRING$(4,246):FOR f=4 TO 9:LOCATE 9,f:PRINT CHR$(246):NEXT
3090 PAPER 5:PEN 7
3100 FOR f=3 TO 19 STEP 2:LOCATE f,18:PRINT CHR$(250):LOCATE f,15:PRINT CHR$(250):LOCATE f,13:PRINT CHR$(250):NEXT
3110 FOR f=3 TO 11 STEP 2:LOCATE 3,f:PRINT CHR$(250):LOCATE 7,f:PRINT CHR$(250):LOCATE 11,f:PRINT CHR$(250):NEXT
3120 FOR f=15 TO 18 STEP 3:LOCATE f,3:PRINT CHR$(250):LOCATE f,5:PRINT CHR$(250):LOCATE f,10:PRINT CHR$(250):NEXT:LOCATE 19,18:PRINT" "
3130 LOCATE 9,11:PRINT CHR$(250)
3140 PEN 15:LOCATE 18,8:PRINT CHR$(252)CHR$(253)
3150 INK 5,0:INK 7,18:INK 9,24:INK 13,6:INK 14,26:INK 15,15
3160 sx=19:sy=18:lasers=0:apples=48:pac=231:b=0:BORDER 0
3170 RETURN
3180 GOSUB 2490
3190 PAPER 14:PEN 13:LOCATE 1,1:PRINT STRING$(20,246):LOCATE 1,20:PRINT STRING$(20,246);:FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246);:NEXT
3200 FOR f=5 TO 13:LOCATE 10,f:PRINT CHR$(246):LOCATE 12,f:PRINT CHR$(246):NEXT
3210 FOR f=3 TO 9:LOCATE 16,f:PRINT CHR$(246);:NEXT:LOCATE 15,3:PRINT CHR$(246)
3220 PEN 12:PAPER 5:LOCATE 13,13:PRINT STRING$(5,249)
3230 PEN 11:LOCATE 5,17:PRINT STRING$(12,251):LOCATE 10,18:PRINT CHR$(251)CHR$(251)
3240 FOR f=13 TO 16:LOCATE 5,f:PRINT CHR$(251):NEXT
3250 PEN 6:LOCATE 8,5:PRINT CHR$(247)CHR$(247):LOCATE 11,13:PRINT CHR$(247):LOCATE 2,19:PRINT CHR$(247):LOCATE 19,19:PRINT CHR$(247)
3260 PEN 8:LOCATE 17,2:PRINT STRING$(3,248):LOCATE 8,7:PRINT CHR$(248)CHR$(248)
3270 PEN 15:LOCATE 8,6:PRINT CHR$(252)CHR$(253)
3280 PEN 7:FOR f=7 TO 19 STEP 2:LOCATE f,14:PRINT CHR$(250):LOCATE f,16:PRINT CHR$(250):NEXT
3290 FOR f=12 TO 16:LOCATE f,18:PRINT CHR$(250):NEXT:FOR f=4 TO 12 STEP 2:LOCATE 19,f:PRINT CHR$(250):NEXT:FOR f=2 TO 12 STEP 2:LOCATE 14,f:PRINT CHR$(250):NEXT
3300 FOR f=2 TO 8 STEP 2:LOCATE 11,f:PRINT CHR$(250):NEXT f
3310 FOR f=5 TO 9 STEP 2:LOCATE 17,f:PRINT CHR$(250):NEXT:LOCATE 17,12:PRINT CHR$(250):LOCATE 3,6:PRINT CHR$(250)" "CHR$(250):LOCATE 3,9:PRINT CHR$(250)" "CHR$(250):LOCATE 3,11:PRINT CHR$(250)" "CHR$(250)
3320 LOCATE 3,14:PRINT CHR$(250):LOCATE 3,17:PRINT CHR$(250)
3330 INK 5,1:INK 6,18:INK 7,2:INK 8,16:INK 9,24:INK 11,23:INK 12,7:INK 13,6:INK 14,3:INK 15,15
3340 BORDER 1:b=1:pac=232
3350 lasers=0:sx=11:sy=10:apples=46:RETURN
3360 GOSUB 2490
3370 PEN 8:LOCATE 2,1:PRINT STRING$(18,248):PEN 6:LOCATE 2,20:PRINT STRING$(18,247):LOCATE 9,11:PRINT STRING$(3,247):LOCATE 9,10:PRINT CHR$(247)" "CHR$(247)
3380 PAPER 14:PEN 13:FOR f=1 TO 20:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246);:NEXT:LOCATE 17,10:PRINT CHR$(246)CHR$(246)CHR$(246)
3390 PAPER 5:PEN 10:LOCATE 3,4:PRINT STRING$(15,238):LOCATE 3,17:PRINT STRING$(15,238):LOCATE 6,7:PRINT STRING$(9,238):LOCATE 6,14:PRINT STRING$(9,238)
3400 FOR f=5 TO 16:LOCATE 3,f:PRINT CHR$(238):LOCATE 17,f:PRINT CHR$(238):NEXT:FOR f=8 TO 13:LOCATE 6,f:PRINT CHR$(238):LOCATE 14,f:PRINT CHR$(238):NEXT
3410 PEN 7:FOR f=4 TO 16 STEP 6:LOCATE f,5:PRINT CHR$(250):LOCATE f,16:PRINT CHR$(250):NEXT:FOR f=9 TO 12 STEP 3:LOCATE 4,f:PRINT CHR$(250):LOCATE 16,f:PRINT CHR$(250):NEXT
3420 LOCATE 18,9:PRINT CHR$(250)CHR$(250)
3430 LOCATE 7,8:PRINT STRING$(7,250):LOCATE 7,13:PRINT STRING$(7,250):FOR f=9 TO 12:LOCATE 7,f:PRINT CHR$(250):LOCATE 13,f:PRINT CHR$(250):NEXT
3440 PAPER 14:PEN 13:LOCATE 17,10:PRINT CHR$(246)
3450 PEN 15:PAPER 5:LOCATE 18,19:PRINT CHR$(252)CHR$(253)
3460 lasers=0:sx=10:sy=10:pac=232:b=9:BORDER 9
3470 apples=34
3480 INK 5,9:INK 6,18:INK 7,16:INK 8,5:INK 9,24:INK 10,26:INK 13,17:INK 14,10:INK 15,15
3490 RETURN
3500 GOSUB 2490
3510 PEN 11:PAPER 5:LOCATE 1,1:PRINT STRING$(20,251):LOCATE 1,20:PRINT STRING$(20,251);
3520 PEN 12:PAPER 14:FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246):NEXT
3530 PEN 13
3540 LOCATE 4,3:PRINT STRING$(5,246):LOCATE 4,4:PRINT STRING$(5,246):LOCATE 3,5:PRINT STRING$(7,246):LOCATE 3,6:PRINT STRING$(7,246):LOCATE 8,7:PRINT CHR$(246)CHR$(246):LOCATE 8,8:PRINT CHR$(246)CHR$(246)
3550 FOR f=7 TO 12:LOCATE 3,f:PRINT CHR$(246)CHR$(246):NEXT:LOCATE 8,11:PRINT CHR$(246)CHR$(246):LOCATE 8,12:PRINT CHR$(246)CHR$(246)
3560 LOCATE 3,13:PRINT STRING$(7,246):LOCATE 3,14:PRINT STRING$(7,246):LOCATE 4,15:PRINT STRING$(5,246):LOCATE 4,16:PRINT STRING$(5,246)
3570 FOR f=5 TO 16:LOCATE 11,f:PRINT CHR$(246)CHR$(246):LOCATE 16,f:PRINT CHR$(246)CHR$(246):NEXT:FOR f=5 TO 10:LOCATE 13,f:PRINT CHR$(246):LOCATE 14,f+2:PRINT CHR$(246):LOCATE 15,f:PRINT CHR$(246):NEXT:LOCATE 12,4:PRINT CHR$(246)
3580 LOCATE 16,4:PRINT CHR$(246):LOCATE 9,19:PRINT CHR$(246):PAPER 5:PEN 10:LOCATE 12,3:PRINT CHR$(238):LOCATE 16,3:PRINT CHR$(238):LOCATE 18,7:PRINT CHR$(238)CHR$(238)
3590 PEN 6:LOCATE 2,19:PRINT CHR$(247):LOCATE 19,19:PRINT CHR$(247)
3600 PEN 8:LOCATE 3,15:PRINT CHR$(248):LOCATE 9,15:PRINT CHR$(248):LOCATE 15,11:PRINT CHR$(248)
3610 PEN 7:FOR f=2 TO 18 STEP 2:LOCATE f,2:PRINT CHR$(250):LOCATE 2,f:PRINT CHR$(250):NEXT:LOCATE 4,18:PRINT CHR$(250)" "CHR$(250):FOR f=8 TO 18 STEP 2:LOCATE f,17:PRINT CHR$(250):NEXT
3620 LOCATE 14,15:PRINT CHR$(250):LOCATE 5,7:PRINT CHR$(250)" "CHR$(250):LOCATE 5,12:PRINT CHR$(250)" "CHR$(250):LOCATE 18,10:PRINT CHR$(250):LOCATE 18,14:PRINT CHR$(250)
3630 FOR f=5 TO 9 STEP 2:LOCATE f,9:PRINT CHR$(250):LOCATE f,10:PRINT CHR$(250):NEXT
3640 FOR f=11 TO 15 STEP 2:LOCATE 10,f:PRINT CHR$(250):NEXT:FOR f=4 TO 8 STEP 2:LOCATE 10,f:PRINT CHR$(250):NEXT
3650 LOCATE 18,4:PRINT CHR$(250):LOCATE 14,4:PRINT CHR$(250)
3660 PEN 15:LOCATE 10,19:PRINT CHR$(252)CHR$(253)
3670 LOCATE 12,2:PRINT" "
3680 lasers=0:sx=14:sy=13:pac=233:apples=44
3690 BORDER 3:INK 5,3:b=3:INK 6,18:INK 7,13:INK 8,6:INK 9,24:INK 10,1:INK 11,4:INK 13,9,14:INK 14,21:INK 15,26:INK 12,26,0:SPEED INK 25,25
3700 RETURN
3710 GOSUB 2490
3720 PAPER 14:PEN 13:LOCATE 1,1:PRINT STRING$(20,246):LOCATE 1,20:PRINT STRING$(20,246);:FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246):NEXT
3730 PAPER 5:PEN 12:LOCATE 2,4:PRINT STRING$(18,249)
3740 PEN 15:LOCATE 10,4:PRINT CHR$(252)CHR$(253)
3750 PEN 6:mess$=CHR$(247):LOCATE 3,2:GOSUB 2440:LOCATE 18,2:GOSUB 2440
3760 PEN 8:LOCATE 5,2:mess$="BONUS  SHEET":GOSUB 2440
3770 PEN 7
3780 c=2:FOR z=1 TO 40
3790 LOCATE RND*17+2,RND*11+7:|GETCHAR,c,0:IF c=250 THEN 3790
3800 PRINT CHR$(250);:NEXT z
3810 apples=10:lasers=0:sx=2:sy=19:pac=230:b=12:af1=2:af2=1:BORDER 12
3820 INK 5,12:INK 6,18,9:INK 7,23:INK 8,8,17:INK 9,24:INK 12,6:INK 13,0:INK 14,10:INK 15,26
3830 RETURN
3840 GOSUB 2490
3850 PAPER 14:PEN 13:LOCATE 1,1:PRINT STRING$(20,246):LOCATE 1,20:PRINT STRING$(20,246);
3860 FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246):NEXT
3870 PEN 12:PAPER 5:LOCATE 2,18:PRINT STRING$(16,249):LOCATE 19,18:PRINT CHR$(249)
3880 PEN 11:LOCATE 12,14:PRINT STRING$(8,251):LOCATE 12,11:PRINT STRING$(6,251)
3890 PEN 10:LOCATE 2,15:PRINT STRING$(8,238):LOCATE 2,3:PRINT CHR$(238)CHR$(238):LOCATE 4,2:PRINT CHR$(238):LOCATE 19,19:PRINT CHR$(238)
3900 PEN 8:LOCATE 10,15:PRINT CHR$(248)CHR$(248):LOCATE 2,11:PRINT STRING$(10,248)
3910 PEN 3:LOCATE 2,17:PRINT STRING$(18,154):LOCATE 4,6:PRINT STRING$(5,154)
3920 PEN 4:FOR f=2 TO 10:LOCATE 6,f:PRINT CHR$(149):LOCATE 9,f:PRINT CHR$(149):LOCATE 13,f:PRINT CHR$(149):LOCATE 17,f:PRINT CHR$(149):NEXT
3930 FOR f=5 TO 10:LOCATE 3,f:PRINT CHR$(149):NEXT
3940 PEN 7
3950 LOCATE 4,17:PRINT CHR$(250):LOCATE 7,17:PRINT CHR$(250):FOR f=13 TO 17 STEP 2:LOCATE f,17:PRINT CHR$(250):NEXT
3960 FOR f=5 TO 11 STEP 2:LOCATE f,13:PRINT CHR$(250):NEXT:FOR f=15 TO 19 STEP 2:LOCATE f,12:PRINT CHR$(250):NEXT
3970 FOR f=4 TO 10 STEP 2:LOCATE 19,f:PRINT CHR$(250):NEXT
3980 FOR f=3 TO 9 STEP 2:LOCATE 4,f:PRINT CHR$(250):LOCATE 8,f:PRINT CHR$(250):LOCATE 11,f:PRINT CHR$(250):LOCATE 15,f:PRINT CHR$(250):NEXT
3990 PEN 15:LOCATE 2,2:PRINT CHR$(252)CHR$(253)
4000 PEN 13:PAPER 14:LOCATE 10,17:PRINT CHR$(246)CHR$(246):LOCATE 3,6:PRINT CHR$(246):LOCATE 6,6:PRINT CHR$(246):LOCATE 9,6:PRINT CHR$(246):PAPER 5
4010 apples=33:lasers=1:sx=2:sy=19:pac=230
4020 lon1=10:loff1=100:lon2=10:loff2=80:link=26
4030 BORDER 4:b=4
4040 INK 3,4:INK 4,4:INK 5,4:INK 7,6:INK 8,0:INK 9,24:INK 10,13:INK 11,18:INK 12,23:INK 13,1:INK 14,14:INK 15,15
4050 RETURN
4060 GOSUB 2490
4070 PEN 11:LOCATE 1,1:PRINT STRING$(20,251):PEN 6:LOCATE 1,20:PRINT STRING$(20,247);:FOR f=7 TO 14:LOCATE 3,f:PRINT CHR$(247):NEXT
4080 FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(247):LOCATE 20,f:PRINT CHR$(247):NEXT
4090 PEN 11:LOCATE 7,5:PRINT STRING$(9,251):LOCATE 5,15:PRINT STRING$(13,251)
4100 PEN 13:PAPER 14:FOR f=7 TO 13:LOCATE 7,f:PRINT CHR$(246):LOCATE 15,f:PRINT CHR$(246):NEXT:FOR f=0 TO 1:LOCATE 5,12+f:PRINT CHR$(246):LOCATE 10,8+f:PRINT CHR$(246):LOCATE 12,8+f:PRINT CHR$(246):LOCATE 10,11+f:PRINT CHR$(246):LOCATE 12,11+f
4110 PRINT CHR$(246):LOCATE 17,12+f:PRINT CHR$(246):NEXT
4120 LOCATE 7,16:PRINT CHR$(246):LOCATE 13,16:PRINT CHR$(246):LOCATE 7,18:PRINT CHR$(246):LOCATE 15,18:PRINT CHR$(246):LOCATE 6,7:PRINT CHR$(246):LOCATE 16,7:PRINT CHR$(246)
4130 PAPER 5
4140 PEN 8:LOCATE 15,19:PRINT CHR$(248)
4150 PEN 10:LOCATE 10,17:PRINT CHR$(238)
4160 PEN 3:LOCATE 2,4:PRINT STRING$(18,154)
4170 PEN 4:FOR f=6 TO 14:LOCATE 9,f:PRINT CHR$(149):LOCATE 13,f:PRINT CHR$(149):NEXT
4180 FOR f=16 TO 19:LOCATE 5,f:PRINT CHR$(149)CHR$(149):NEXT
4190 PEN 7:FOR f=3 TO 19 STEP 2:LOCATE f,2:PRINT CHR$(250):NEXT
4200 FOR f=8 TO 14 STEP 2:LOCATE 4,f:PRINT CHR$(250):LOCATE 6,f:PRINT CHR$(250):LOCATE 16,f:PRINT CHR$(250):LOCATE 18,f:PRINT CHR$(250):NEXT
4210 LOCATE 5,7:PRINT CHR$(250):LOCATE 11,7:PRINT CHR$(250):LOCATE 17,7:PRINT CHR$(250):LOCATE 8,10:PRINT CHR$(250):LOCATE 14,10:PRINT CHR$(250):LOCATE 11,13:PRINT CHR$(250)
4220 LOCATE 10,16:PRINT CHR$(250):LOCATE 15,16:PRINT CHR$(250):LOCATE 17,17:PRINT CHR$(250):LOCATE 19,18:PRINT CHR$(250)
4230 PEN 15:LOCATE 18,19:PRINT CHR$(252)CHR$(253)
4240 apples=35:sx=11:sy=10:pac=232
4250 lasers=1:lon1=15:loff1=90:lon2=5:loff2=50:link=18
4260 b=10:BORDER 10
4270 INK 3,10:INK 4,10:INK 5,10:INK 6,8:INK 7,23:INK 8,16:INK 9,24:INK 10,3:INK 11,6:INK 13,9:INK 14,13:INK 15,15
4280 RETURN
4290 GOSUB 2490
4300 PAPER 14:PEN 13:PRINT STRING$(14,246):LOCATE 1,20:PRINT STRING$(19,246):FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):NEXT:PAPER 5
4310 PEN 10:LOCATE 15,1:PRINT CHR$(214)STRING$(5,143):FOR f=2 TO 5:LOCATE 15,f:PRINT STRING$(6,143):NEXT
4320 FOR f=6 TO 10:LOCATE (10-f)+10,f:PRINT CHR$(214)STRING$(f,143):NEXT
4330 LOCATE 10,11:PRINT STRING$(11,143):LOCATE 15,12:PRINT STRING$(6,143):FOR f=13 TO 14:LOCATE 19,f:PRINT CHR$(143)CHR$(143):NEXT
4340 FOR f=15 TO 17:LOCATE 15,f:PRINT STRING$(6,143):NEXT
4350 LOCATE 19,18:PRINT CHR$(213)CHR$(143):FOR f=19 TO 20:LOCATE 20,f:PRINT CHR$(143);:NEXT
4360 PAPER 11:PEN 12:LOCATE 16,5:PRINT"FO":LOCATE 17,6:PRINT"D":PAPER 5
4370 PEN 6:FOR f=5 TO 7:LOCATE (7-f)+9,f:PRINT CHR$(247):NEXT
4380 LOCATE 5,17:PRINT STRING$(5,247)
4390 LOCATE 5,18:PRINT STRING$(2,247)
4400 LOCATE 8,19:PRINT STRING$(2,247)
4410 PEN 14:LOCATE 2,2:PRINT CHR$(212):LOCATE 4,4:PRINT CHR$(212)
4420 PEN 3:LOCATE 3,2:PRINT STRING$(12,154):LOCATE 5,4:PRINT STRING$(10,154)
4430 PEN 4:FOR f=3 TO 19:LOCATE 2,f:PRINT CHR$(149):NEXT:FOR f=5 TO 19:LOCATE 4,f:PRINT CHR$(149):NEXT
4440 FOR f=12 TO 19:LOCATE 11,f:PRINT CHR$(149):NEXT
4450 PEN 7:FOR f=10 TO 16 STEP 2:LOCATE f,19:PRINT CHR$(250):LOCATE f+1,18:PRINT CHR$(250):NEXT
4460 FOR f=10 TO 19 STEP 3:LOCATE 3,f:PRINT CHR$(250):LOCATE 6,f:PRINT CHR$(250):NEXT
4470 FOR f=8 TO 18 STEP 2:LOCATE f,14:PRINT CHR$(250):NEXT
4480 FOR f=12 TO 14 STEP 2:LOCATE f,12:PRINT CHR$(250):NEXT:FOR f=2 TO 8 STEP 2:LOCATE f,8:PRINT CHR$(250):NEXT
```

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4490 FOR f=5 TO 8:LOCATE (8-f)+10,f:PRINT CHR$(250):NEXT:FOR f=3 TO 11 STEP 4:LOCATE f,3:PRINT CHR$(250):NEXT
4500 FOR f=5 TO 9 STEP 4:LOCATE f,2:PRINT CHR$(250):NEXT:LOCATE 13,3:PRINT CHR$(250)
4510 PEN 15:LOCATE 17,13:PRINT CHR$(252)CHR$(253)
4520 apples=31:lasers=1:lon1=10:loff1=60:lon2=15:loff2=80:link=25
4530 b=0:BORDER 0:INK 5,0:INK 3,0:INK 4,0:INK 6,6:INK 7,23:INK 9,24:INK 10,16:INK 11,14:INK 12,11,14:INK 13,10:INK 14,21:INK 15,2
4540 af1=16:af2=13:sx=19:sy=19:pac=231
4550 RETURN
4560 GOSUB 2490
4570 PAPER 14:PEN 13:FOR f=5 TO 17 STEP 4:LOCATE f,10:PRINT CHR$(246):LOCATE f,14:PRINT CHR$(246):NEXT:FOR f=2 TO 4:LOCATE 4,f:PRINT CHR$(246):NEXT:LOCATE 3,4:PRINT CHR$(246):LOCATE 19,3:PRINT CHR$(246)
4580 PAPER 5:PEN 8:LOCATE 2,1:PRINT STRING$(18,248)
4590 LOCATE 11,6:PRINT CHR$(248):LOCATE 10,9:PRINT CHR$(248)" "CHR$(248):LOCATE 3,11:PRINT CHR$(248):LOCATE 3,13:PRINT CHR$(248)
4600 PEN 11:LOCATE 9,5:PRINT STRING$(5,251):LOCATE 4,7:PRINT CHR$(251)CHR$(251)" "CHR$(251)CHR$(251):LOCATE 15,7:PRINT CHR$(251)CHR$(251)" "CHR$(251)
4610 PEN 12:FOR f=1 TO 15:LOCATE 1,f:PRINT CHR$(249):LOCATE 20,f:PRINT CHR$(249):NEXT
4620 LOCATE 3,17:PRINT CHR$(249)CHR$(238)CHR$(249)" "STRING$(3,249)CHR$(238)" "CHR$(249)" "CHR$(249)CHR$(238)CHR$(249)" "CHR$(249)CHR$(238)
4630 LOCATE 3,12:PRINT CHR$(238)
4640 PEN 6:LOCATE 11,5:PRINT CHR$(247):LOCATE 9,8:PRINT CHR$(247)CHR$(247)" "CHR$(247)CHR$(247):LOCATE 11,17:PRINT CHR$(247)
4650 LOCATE 1,20:PRINT STRING$(20,247);:FOR f=16 TO 19:LOCATE 1,f:PRINT CHR$(247):LOCATE 20,f:PRINT CHR$(247):NEXT
4660 FOR f=18 TO 19:LOCATE 5,f:PRINT CHR$(247):LOCATE 11,f:PRINT CHR$(247):LOCATE 16,f:PRINT CHR$(247):NEXT
4670 PEN 3:LOCATE 5,3:PRINT STRING$(14,154):FOR f=6 TO 14 STEP 4:LOCATE f,10:PRINT STRING$(3,154):LOCATE f,14:PRINT STRING$(3,154):NEXT
4680 PEN 4:FOR f=5 TO 17 STEP 4:FOR g=11 TO 13:LOCATE f,g:PRINT CHR$(149):NEXT g,f
4690 PEN 7:LOCATE 2,2:PRINT CHR$(250)CHR$(250):LOCATE 2,3:PRINT CHR$(250)CHR$(250):FOR f=6 TO 16 STEP 5:LOCATE f,2:PRINT CHR$(250):LOCATE f,4:PRINT CHR$(250):NEXT
4700 LOCATE 17,7:PRINT CHR$(250):LOCATE 18,10:PRINT CHR$(250):LOCATE 7,12:PRINT CHR$(250):LOCATE 15,12:PRINT CHR$(250):FOR f=11 TO 13:LOCATE 11,f:PRINT CHR$(250):NEXT
4710 LOCATE 3,19:PRINT CHR$(250):LOCATE 7,19:PRINT CHR$(250):LOCATE 9,18:PRINT CHR$(250):LOCATE 13,18:PRINT CHR$(250):LOCATE 15,19:PRINT CHR$(250):LOCATE 18,19:PRINT CHR$(250)
4720 PEN 15:LOCATE 18,2:PRINT CHR$(252)CHR$(253)
4730 lasers=1:lon1=10:loff1=100:lon2=15:loff2=90:link=14
4740 apples=17:af1=0:af2=2:sx=4:sy=9:pac=233
4750 b=15:BORDER 15:INK 5,15:INK 3,15:INK 4,15:INK 6,18:INK 7,7:INK 8,23:INK 9,24:INK 10,1:INK 11,6:INK 12,1:INK 13,0,1:INK 14,12:INK 15,26
4760 RETURN
4770 GOSUB 2490
4780 LOCATE 1,1:PEN 13:PAPER 14:PRINT STRING$(20,246):FOR f=2 TO 19:LOCATE 1,f:PRINT CHR$(246):LOCATE 20,f:PRINT CHR$(246):NEXT:LOCATE 1,20:PRINT STRING$(20,246);
4790 FOR f=5 TO 8:LOCATE 6,f:PRINT CHR$(246):NEXT:LOCATE 6,9:PRINT STRING$(4,246):LOCATE 9,10:PRINT STRING$(2,246):FOR f=11 TO 13:LOCATE 10,f:PRINT CHR$(246):NEXT
4800 FOR f=4 TO 8:LOCATE 11,f:PRINT CHR$(246):NEXT:LOCATE 12,5:PRINT STRING$(4,246):LOCATE 15,6:PRINT CHR$(246):LOCATE 12,8:PRINT CHR$(246):LOCATE 12,9:PRINT STRING$(5,246)
4810 PAPER 5:LOCATE 12,11:PRINT CHR$(214)STRING$(3,143)CHR$(215):FOR f=12 TO 13:LOCATE 12,f:PRINT CHR$(143):LOCATE 16,f:PRINT CHR$(143):NEXT:LOCATE 12,14:PRINT CHR$(213)"   "CHR$(212)
4820 PEN 14:FOR f=12 TO 14:LOCATE (12-f)+9,f:PRINT CHR$(214):LOCATE (12-f)+9,f+1:PRINT CHR$(212):LOCATE (12-f)+4,f+1:PRINT CHR$(214):LOCATE (12-f)+4,f+2:PRINT CHR$(212):NEXT
4830 FOR f=13 TO 14:LOCATE f-8,f:PRINT CHR$(215):LOCATE f-8,f+1:PRINT CHR$(213):NEXT
4840 PEN 12:LOCATE 4,7:PRINT CHR$(249):LOCATE 4,18:PRINT STRING$(5,249):LOCATE 11,17:PRINT STRING$(6,249)
4850 PEN 8:LOCATE 8,2:PRINT CHR$(248):LOCATE 9,3:PRINT CHR$(248):LOCATE 14,3:PRINT STRING$(3,248):LOCATE 6,10:PRINT CHR$(248)
4860 PEN 6:LOCATE 2,4:PRINT CHR$(247):LOCATE 12,4:PRINT CHR$(247):LOCATE 17,7:PRINT STRING$(2,247):LOCATE 19,10:PRINT CHR$(247):LOCATE 9,11:PRINT CHR$(247):LOCATE 14,13:PRINT CHR$(247):LOCATE 2,19:PRINT CHR$(247):LOCATE 18,18:PRINT STRING$(2,247)
4870 PEN 7:FOR f=11 TO 19 STEP 2:LOCATE f,2:PRINT CHR$(250):NEXT:FOR f=4 TO 8 STEP 2:LOCATE 19,f:PRINT CHR$(250):NEXT:FOR f=2 TO 11 STEP 3:LOCATE 2,f:PRINT CHR$(250):NEXT
4880 FOR f=4 TO 7 STEP 2:LOCATE 8,f:PRINT CHR$(250)" "CHR$(250):LOCATE 7,f+1:PRINT CHR$(250)" "CHR$(250):NEXT:LOCATE 8,8:PRINT CHR$(250)" "CHR$(250)
4890 FOR f=13 TO 15 STEP 2:LOCATE f,4:PRINT CHR$(250):LOCATE f,8:PRINT CHR$(250):NEXT
4900 FOR f=12 TO 16 STEP 2:LOCATE f,7:PRINT CHR$(250):NEXT:LOCATE 13,6:PRINT CHR$(250):LOCATE 16,5:PRINT CHR$(250)
4910 LOCATE 4,2:PRINT CHR$(250)CHR$(250)" "CHR$(250):LOCATE 5,6:PRINT CHR$(250):LOCATE 8,10:PRINT CHR$(250):LOCATE 2,13:PRINT CHR$(250):LOCATE 4,12:PRINT CHR$(250):LOCATE 6,13:PRINT CHR$(250)CHR$(250)
4920 FOR f=12 TO 16 STEP 2:LOCATE 19,f:PRINT CHR$(250):NEXT:FOR f=11 TO 17 STEP 3:LOCATE f,10:PRINT CHR$(250):NEXT:LOCATE 11,13:PRINT CHR$(250):LOCATE 13,12:PRINT CHR$(250)" "CHR$(250):LOCATE 13,14:PRINT CHR$(250)" "CHR$(250)
4930 FOR f=11 TO 15 STEP 2:LOCATE f,16:PRINT CHR$(250):LOCATE f+1,18:PRINT CHR$(250):NEXT:FOR f=3 TO 9 STEP 2:LOCATE f,17:PRINT CHR$(250):LOCATE f+1,19:PRINT CHR$(250):NEXT
4940 PEN 10:PAPER 14:LOCATE 10,19:PRINT"LAST SHEET"
4950 PAPER 5:PEN 15:LOCATE 10,9:PRINT CHR$(252)CHR$(253)
4960 lasers=0:apples=60:a1=1:a2=3
4970 sx=9:sy=2:pac=230
4980 SPEED INK 30,30:b=16:BORDER 16:INK 5,16:INK 6,16,25:INK 7,26:INK 8,11,16:INK 9,24:INK 10,2,6:INK 12,20:INK 13,9:INK 14,1:INK 15,18
4990 RETURN
5000 c=3:SOUND 135,0,0,1:LOCATE #1,20,2:PRINT#1," ":LOCATE #1,20,3:PRINT#1," ":LOCATE #1,6,4:PRINT#1,"       ":LOCATE #1,6,5:PRINT#1,"       ":LOCATE #1,17,4:PRINT#1,"   ":LOCATE #1,17,5:PRINT#1,"   "
5010 BORDER 0:FOR f=3 TO 15:INK f,0:NEXT
5020 l=640:h=320:x=80:FOR f=0 TO 320 STEP 4:PLOT f,x,c:DRAWR l,0:DRAWR 0,h:DRAWR -l,0:DRAWR 0,-h:l=l-8:h=h-4:x=x+2:c=c+1:IF c=16 THEN c=3
5030 NEXT
5040 FOR i=1 TO 100 STEP 4
5050 FOR f=15 TO 3 STEP -1:INK f,26:CALL &BD19:INK f,0:NEXT f
5060 SOUND 7,i+20,20,7,0,4:NEXT i
5070 CLS
5080 INK 3,7:INK 4,26,13:INK 6,2,24
5090 LOCATE 3,1:PEN 3:mess$="CONGRATULATIONS!":GOSUB 2440
5100 PEN 4:LOCATE 4,8:mess$="MEGA - BONUS =":GOSUB 2440
5110 LOCATE 5,11:PEN 6:mess$="5000 POINTS!":GOSUB 2440
5120 TAG#1:PLOT 800,800,2:FOR f=0 TO 5000 STEP 50:MOVE 226,70:PRINT#1,sc+f;:SOUND 7,(5000-f)/5,1,15,0,4:NEXT:sc=sc+5000
5130 TAGOFF#1
5140 INK 9,24:WINDOW SWAP 0,1:mess$=CHR$(230):PEN 9:FOR f=1 TO men:LOCATE (f*2)+4,4:GOSUB 2440:NEXT:LOCATE 20,2:mess$="%":GOSUB 2440:PEN 2:WINDOW SWAP 0,1:b=0:CLS
5150 RETURN
5160 RESTORE 5160:CALL &BCA7
5170 FOR a=1 TO 16:READ a1(a),b1(a):NEXT a
5180 DATA 95,30,100,30,106,30,119,120,119,30
5190 DATA 106,30,95,60,89,150
5200 DATA 127,30,134,30,142,30,159,120,159,30
5210 DATA 119,30,106,60,95,150
5220 FOR a=1 TO 16:READ c1(a),d1(a):NEXT a
5230 DATA 239,210,190,30,0,0,0,0
5240 DATA 213,210,284,30,0,0,0,0
5250 DATA 319,210,213,30,0,0,0,0
5260 DATA 239,240,0,0,0,0,0,0
5270 FOR a=1 TO 16:READ e1(a):NEXT a
5280 DATA 60,60,60,60,45,45,45,45,63,63,63,63,60,60,60,60
5290 FOR a=1 TO 16
5300 SOUND 1,a1(a),b1(a)/1.5,10,13
5310 IF c1(a)<>0 THEN SOUND 4,c1(a),d1(a)/1.5,10,12
5320 SOUND 2,e1(a),40,10,13
5330 NEXT
5340 FOR a=1 TO 16:READ a1(a),b1(a):NEXT a
5350 DATA 95,30,100,30,106,30,119,120,119,30
5360 DATA 106,30,95,60,89,150
5370 DATA 127,30,134,30,142,30,159,120,0,0
5380 DATA 0,0,63,30,119,180
5390 FOR a=1 TO 16
5400 IF b1(a)<>0 THEN SOUND 1,a1(a),b1(a)/1.5,10,13
5410 IF c1(a)<>0 THEN SOUND 4,c1(a),d1(a)/1.5,10,12
5420 SOUND 2,e1(a),40,10,13
5430 NEXT
5440 IF sc<hi(9) THEN 5790
5450 FOR f=1 TO 1000:NEXT
5460 INK 0,0:BORDER 0:MODE 1:INK 1,0:INK 2,0:INK 3,26:WINDOW 1,40,1,13:PAPER 2:CLS
5470 WINDOW 1,40,1,25:PEN 1:PRINT CHR$(23)CHR$(1);
5480 FOR f=9 TO 0 STEP -1:IF sc>hi(f) THEN NEXT
5490 f=f+1
5500 FOR g=9 TO f+1 STEP -1:hi(g)=hi(g-1):hi$(g)=hi$(g-1):NEXT
5510 hi$(f)=SPACE$(20):hi(f)=sc
5520 FOR g=0 TO 9:LOCATE 5,g+3:PRINT g+1:LOCATE 9,g+3:PRINT hi$(g):LOCATE 30,g+3:PRINT hi(g):NEXT
5530 FOR g=0 TO 639 STEP 4:MOVE g,192:DRAWR 0,208,2:MOVE 639-g,192:DRAWR 0,208:NEXT
5540 INK 1,1:INK 2,11
5550 PAPER 1:LOCATE 9,f+3:PRINT hi$(f);:hi$(f)=""
5560 LOCATE 1,18:PAPER 2:PEN 1:PRINT"WELL DONE YOU HAVE ONE OF TODAYS HIGHESTSCORES. PLEASE ENTER YOUR NAME USING THE       LEFT, RIGHT AND FIRE CONTROLS.       "
5570 PAPER 1:PEN 2:LOCATE 1,25:a$="ABCDEFGHIJKLMNOPQRSTUVWXYZ. SPC RUB END ":PRINT LEFT$(a$,28);:PEN 3:PRINT RIGHT$(a$,12);
5580 sl!=HIMEM+190:sr!=HIMEM+232:POKE sl!+1,128:POKE sl!+2,199:POKE sr!+1,128:POKE sr!+2,199
5590 LOCATE 20,23:PEN 3:PAPER 0:PRINT CHR$(231)
5600 p=20:d=0:pac=231:frame=0
5610 l1=INKEY(71):l2=INKEY(74):r1=INKEY(63):r2=INKEY(75):f1=INKEY(18):f2=INKEY(76)
5620 LOCATE 20,23:PRINT CHR$(pac+(frame*4)):frame=(1-frame)
5630 IF r1<>-1 OR r2<>-1 THEN CALL sl!:LOCATE 20,23:pac=230:p=p+1:IF p>40 THEN p=1
5640 IF l1<>-1 OR l2<>-1 THEN CALL sr!:pac=231:p=p-1:IF p<1 THEN p=40
5650 IF f1<>-1 OR f2<>-1 THEN 5680
5660 FOR g=1 TO 100:NEXT
5670 GOTO 5610
5680 SOUND 7,150,10,15,0,2:IF p>27 THEN 5730 ELSE e$=MID$(a$,p,1)
5690 hi$(f)=hi$(f)+e$
5700 LOCATE 9,f+3:PAPER 1:PEN 2:PRINT hi$(f)SPACE$(20-LEN(hi$(f)));:PAPER 0:PEN 3:IF LEN(hi$(f))=20 THEN 5770
5710 FOR g=1 TO 100:NEXT
5720 GOTO 5610
5730 IF p<32 THEN e$=" ":GOTO 5690
5740 IF p>31 AND p<36 AND hi$(f)<>"" THEN hi$(f)=LEFT$(hi$(f),LEN(hi$(f))-1):LOCATE 9,f+3:GOTO 5700
5750 IF p>35 THEN 5770
5760 GOTO 5710
5770 LOCATE 9,f+3:PRINT hi$(f)SPACE$(20-LEN(hi$(f))):WINDOW 1,40,13,25:CLS:WINDOW 1,40,1,25
5780 GOTO 5820
5790 INK 0,0:BORDER 0:MODE 1:INK 1,0:INK 2,0:INK 3,26:WINDOW 1,40,1,13:PAPER 2:CLS
5800 WINDOW 1,40,1,25:PEN 1:PRINT CHR$(23)CHR$(1);
5810 FOR g=0 TO 9:LOCATE 5,g+3:PRINT g+1:LOCATE 9,g+3:PRINT hi$(g):LOCATE 30,g+3:PRINT hi(g):NEXT:FOR g=0 TO 639 STEP 4:MOVE g,192:DRAWR 0,208,2:MOVE 639-g,192:DRAWR 0,208:NEXT:INK 1,1:INK 2,11
5820 PRINT CHR$(23)CHR$(0);:PAPER 0:FOR f=1 TO 5:LOCATE 1,1:PRINT CHR$(11):NEXT
5830 LOCATE 10,23:PEN 3:PRINT"PRESS FIRE TO CONTINUE"
5840 RESTORE 5840
5850 ENV 1,10,-1,10
5860 ENV 2,5,1,1,15,-1,20
5870 ENV 3,15,-1,4
5880 FOR a=1 TO 88:READ a1(a):NEXT a
5890 DATA 602,301,602,301,602,301,602,301,602,301,602,301,602,301,602,301,602,301,602,301,602,301,602,301,716,358,716,358,716,358,716,358,804,402,804,402,804,402,804,402,902,451,902,451,902,451,902,451,902,451,902,451,902,451,602,301,602,301,602,3
5900 DATA 602,301
5910 DATA 956,478,956,478,956,478,956,478,716,358,716,358,716,358,716,358,804,402,804,402,804,402,804,402
5920 FOR a=1 TO 88:READ b1(a),c1(a):NEXT a
5930 DATA 0,25,119,25,119,12.5,119,25,119,37.5,134,25,159,25,150,25,0,0,179,75,201,150,0,0,0,0,0,0,0,0,0,0,0,0
5940 DATA 0,0,119,25,119,12.5,119,25,119,37.5,134,25,159,25,150,25,0,0,159,75,179,150,0,0,0,0,0,0,0,0,0,0,0,0
5950 DATA 0,0,150,25,150,12.5,150,25,150,37.5,150,25,159,25,150,25,0,0,159,75,179,275,0,0,0,0,0,0,0,0,201,25,225,25
5960 DATA 239,150,0,0,0,0,0,0,0,0,0,0,225,25,213,25
5970 DATA 201,150,0,0,0,0,0,0,0,0,0,0,179,25,159,25
5980 DATA 150,150,0,0,0,0,0,0,0,0,0,0,159,25,150,25
5990 DATA 134,194,0,0,0,0,0,0,0,0,0,0,0,0,0,0
6000 DATA 0,0,0,0,0,0,0,0,0,0
6010 FOR a=1 TO 88:READ d1(a):NEXT a
6020 DATA 75,0,0,0,0,0,0,0,75,0,0,0,0,0,0,0,75,0,0,0,0,0,0,0,89,0,0,0,0,0,0,0,100,0,0,0,0,0,0,0,113,0,0,0,0,0,0,0,113,0,0,0,0,0,0,0,75,0,0,0,0,0,0,0,119,0,0,0,0,0,0,0,89,0,0,0,0,0,0,0,100,0,0,0,0,0,0,0
6030 WHILE INKEY$<>"":WEND
6040 INK 1,RND*26:INK 2,RND*26:FOR f=0 TO 18 STEP 2:MOVE f,f:DRAW 639-f,f,1:DRAW 639-f,399-f:DRAW f,399-f:DRAW f,f:NEXT
6050 PLOT 639,0,2:FOR f=1 TO 40:GOSUB 6140:NEXT:MOVE 639,383:FOR f=1 TO 40:GOSUB 6140:NEXT
6060 MOVE 0,14:FOR g=1 TO 2:FOR f=1 TO 46:DRAWR 0,4:DRAWR 16,0:DRAWR 0,4:DRAWR -16,0:NEXT:MOVE 623,14:NEXT
6070 FOR b=1 TO 2:FOR a=1 TO 88
6080 SOUND 1,a1(a),25,15,3
6090 IF c1(a)<>0 THEN SOUND 2,b1(a),c1(a),10,2
6100 IF d1(a)<>0 THEN SOUND 4,d1(a),200,12,1
6110 k$=INKEY$: IF k$=CHR$(13) THEN CALL &BCA7:ENV 1,5,1,3,15,-1,10:ENV 2,5,1,1,15,-1,4:ENV 3,5,1,1,3,-1,5:GOTO 1590
6120 NEXT a,b
6130 GOTO 6040
6140 DRAWR 0,16:DRAWR -16,0:DRAWR 0,-12:DRAWR 8,0:DRAWR 0,4:DRAWR -4,0:DRAWR 0,4:DRAWR 8,0:DRAWR 0,-12:DRAWR -16,0
6150 RETURN
6160 RESTORE 6200
6170 DIM m$(15),m(15)
6180 FOR f=0 TO 15:READ m$(f),m(f):NEXT
6190 RETURN
6200 DATA z,16,p,3,x,16,p,2,z,16,p,10,x,4,l,8,x,4,p,8,x,7,l,2,z,3,l,5,x,3,p,2
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ACU

DOPPLEGANGER

Doppleganger is a 'move in three dimensions type game', akin to Knightlore. It uses full colour sprites on a multicolour background and could be described as an arcade adventure.

Set in a gloomy castle, the game requires you to help The Sorceress to find the hidden ingots of precious metal.The Sorceress has an alter ego which can detach itself and pass through doors with green frames. She can only pass through doors with blue frames. Among the hazards inthe castle are spiders and devils. If these attack, they reduce the amount of time remaining which is shown by an egg timer on the screen. (The cassette inlay calls it an hour-glass but it only lasts a couple of minutes).

Control is either by joystick or keyboard. I found it easier to use the keyboard, as diagonal joystick movements did not appear to be counted as valid, like pressing the wrong key. Each persona can carry one object and one key which are picked up by driving over them very precisely. They can be dropped by pressing either CTRL or SPACE. Pressing SHIFT changes from one persona to another. Collecting the keys and finding the uses for the various objects is the main point of the game. The time limit makesit a difficult game although there is a place where The Sorceress can recharge the eggtimer.

I don't know what it is about this game, but it strikes meas being a bit naff. It just doesn't sparkle. I think it maybe the way the game uses its loading screen all the waythrough. This gives the impression there is not much to it.I don't feel I want to go on playing it, because there is nothing more to find.



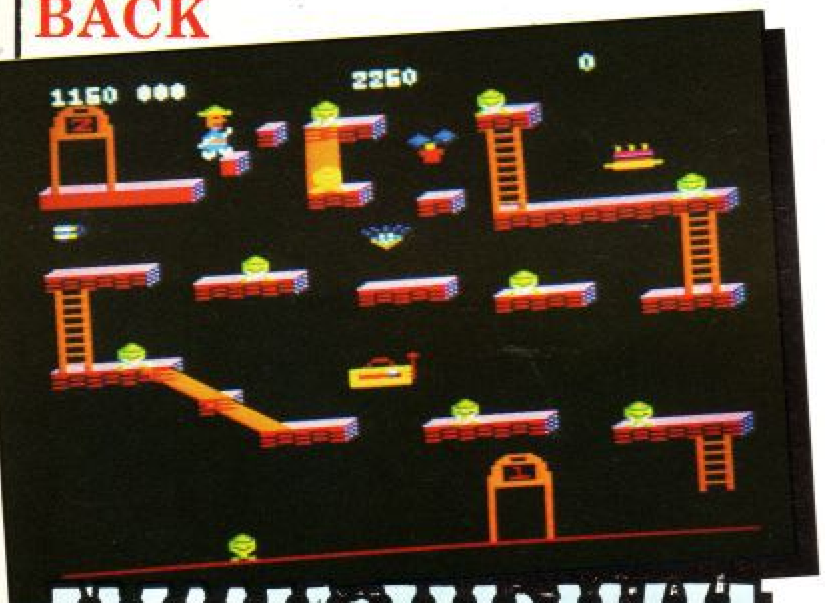
AUTHOR ALLIGATA

PRICE £8.95

GRAPHICS	13	FIRST IMPRESSION	17
SOUND	11	LASTING IMPRESSION	15
POLISH	16	VALUE	15

COMMENT 3-D SCHIZOPHRENIA

BOUNTY BOB STRIKES BACK



AUTHOR U.S. GOLD

PRICE £8.95

GRAPHICS	12	FIRST IMPRESSION	12
SOUND	10	LASTING IMPRESSION	14
POLISH	8	VALUE	12

COMMENT COULD HAVE BEEN SO MUCH BETTER

Bounty Bob is not just another boring platforms and ladders game, it is the sequel to the original platforms and ladders game. Contrary to popular belief 'Manic Miner' was not the first game of this type, Miner 2049'er was. The author, Bill Houge, is reputed to have earned $8m from that game, I can only assume that he wrote this one for the fun of programming.

The plot is pretty familiar, you control a man who has to explore an undergound cavern, pickup objects and get from room to room. Each screen is inhabited by a variety of nasties which become vulnerable for a short time after you have collected an object (or treat as it is known in the instructions). The game is very similar to Manic Miner, however instead of picking up all the objects to complete a screen you need to walk on all the bits of floor. While there is a greater variety of things to do the exploits of Bounty Bob lack the humor of Miner Willys' escapades, all the obstacles are deadly serious, not a rampaging telephone or deadly toilet to be seen.

There is nothing technically very clever about the game, it has been converted for the Amstrad by Abersoft, famous for their Forth, Classic Adventure and soon-to-be-released Basic Compiler. Utilities are obviously what they do best, there is nothing wrong with the conversion but it could have been a lot better. The graphics are poor with little use of colour and no attempt at stippling or shading. The movement is not very smooth, Bounty Bob himself walks with only two frames of animation, with a few more for climbing and jumping. The sound effects are probably a straight lift from the Spectrum conversion, the overall effect is of a very wooden game.

Behind the ordinary dressing is a very good game. Each screen is well designed. Working out how to make the most of the large number of lifts, transporters and vacuum tubes can be most challenging. Unfortunately quite a lot has been lost in translation, including a high score table and a difficulty adjustment. On balance Bounty Bob is an average game, which is a shame, it could have been an excellent one.

BRUCE LEE





AUTHOR U.S. GOLD
PRICE £9.95

GRAPHICS	17	FIRST IMPRESSION	16
SOUND	14	LASTING IMPRESSION	18
POLISH	15	VALUE	18

COMMENT VERY ADDICTIVE DESPITE BUGS

If you crossed 'Manic Miner' with 'The Way of the Exploding Fist' you would probably end up with something like Bruce Lee. You take on the role of the famous Kung Fu master who has to enter the castle and defeat the evil wizard.

The castle is divided up into various subsections and it is necessary for you to collect hanging lanterns within each section to open up a door which will allow you to continue. Two Japanese warriors defend the castle, the black Ninja and the green Yamo. The Ninja is an agile fighter who moves fast and will hit you with a sword. Yamo is a lumbering sumo wrestler, he is much stronger that the Ninja and so best avoided. In the two player mode one of the players adopts the persona of Bruce Lee and the other of the Green Yamo, every time Bruce Lee gets killed the roles swap. Inside the castle there is a variety of hazards. Deadly bolts fly across gaps and electrified floors have to be crossed. These hazards will kill both you and your assailants as they pursue you through the castle. Several rooms contain mines which explode just after you tread on them. If you run over a mine while you are being chased your foe will be killed by the mine. In addition to the ladders and platforms within the game there are magic waterfalls. These move up and down, allowing you to hitch a lift.

The best form of defence is attack, you are armed with deadly fists and feet, it only takes a couple of flying kicks to flatten the Ninja, each blow you land on a foe scores valuable points, Bruce Lee can be played on two levels. You can either play for points, fighting it out on the surface against Ninja and Yamo or you can play for rooms. Each room is well designed and takes a little while to crack, some need pixel accuracy and split second timing, some just need quick wits. I found the electrified floors to be the greatest hazard.

Bruce Lee is a US Gold game, and, like most of the US Gold games, started life on Atari and Commodore 64 computers. This was one of my favorite games on the other machines so I approached the conversion with trepidation. Games which have been converted usually lose something in translation. I was delighted to find that the game had improved. The Amstrad version of Bruce Lee has fewer bugs than Commodore 64 Bruce Lee and plays just as well. One small bug *(feature - Ed)* is that a sharp kick from the Green Yamo can push you through a wall. If this happens in the fourth room, as it did to me, you circumvent a substantial part of the maze. A more major bug gave me 98 lives, I wouldn't complain but I've been unable to repeat the feat. It is possible for you to get through a wall by simply going to one side and ducking down.

The game can be played by either one or two players either against each other or against the computer. There are joystick and keyboard options, they keyboard being a little easier to use. When two people are playing you use both keyboard and joystick

The sound is very disappointing with rather tame crunches and thuds from your hitting out and no sound at all from your assaulted foe. The best noise is made as you run along the floor *(if your feet smell and your nose runs then you are made upside down - Ed).*

As I have said before the Amstrad version is very close to the Commodore original, this means that the mode 0 colours have not been used to full effect, the mountain backdrops are very chunky with no attempt at shading. One reason why Bruce Lee converts so well is that there is not that much moving at any one time. The characters are small and the hazards tiny. The only really large objects are the waterfalls.

If you decide to go for points by fighting it is important to avoid getting backed into a corner where Yamo will knock you down as fast as you get up. The most effective form of attack seems to be to kick, run to the opposite side of Yamo and kick again. Providing Ninja stays out of the way you should be able to rack up lots of points quickly.

There is more to a game than just good sound and graphics, as far as I am concerned playability is the most important thing and it is here that Bruce Lee wins - he certainly doesn't in my 464.

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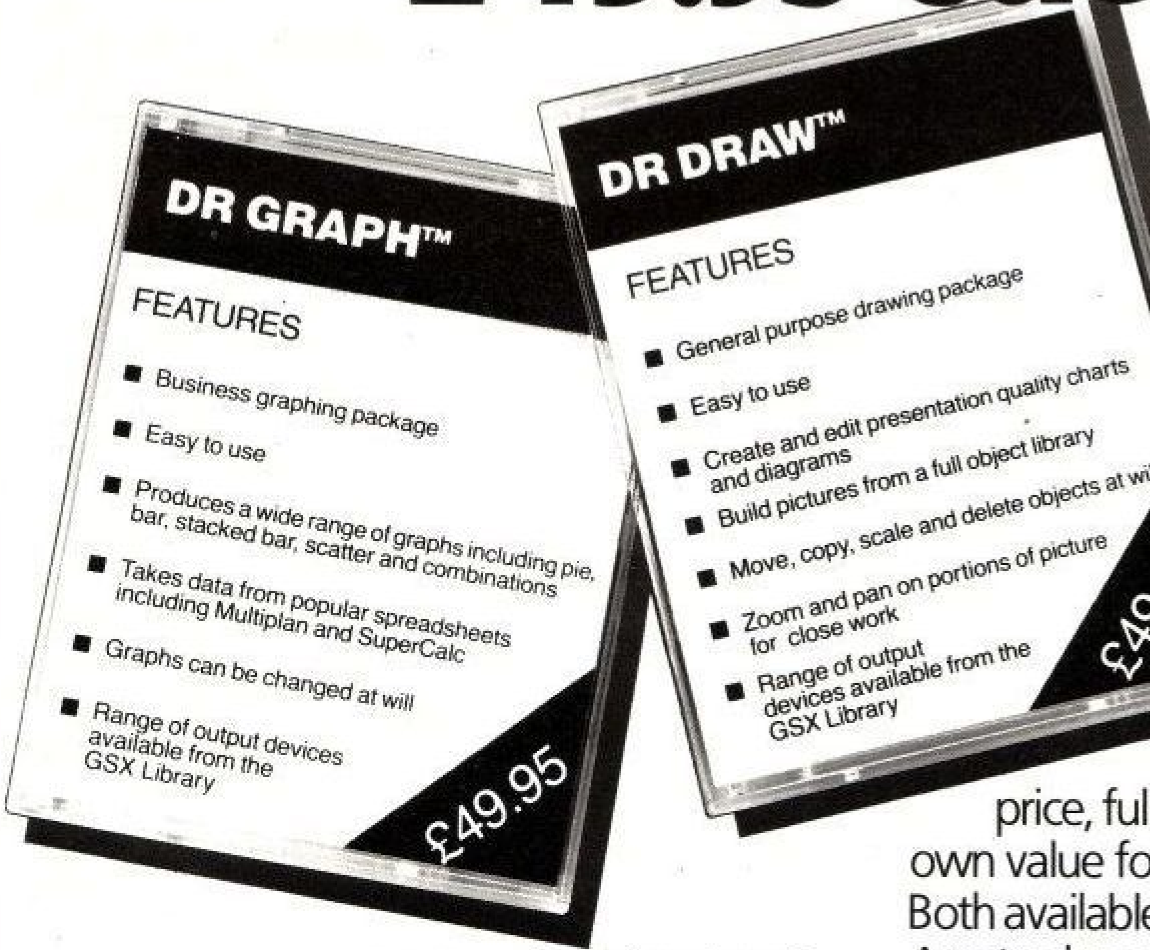
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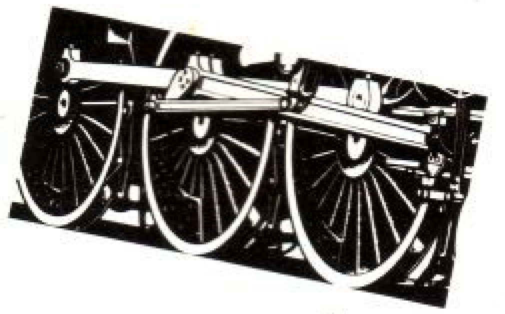

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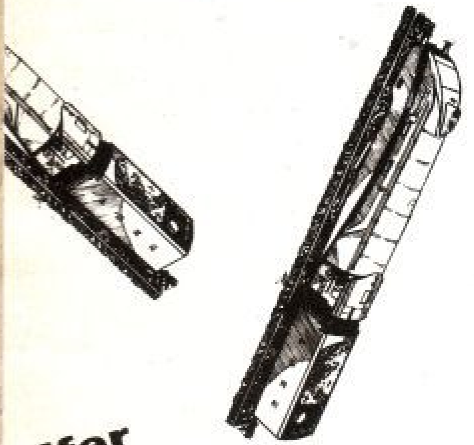
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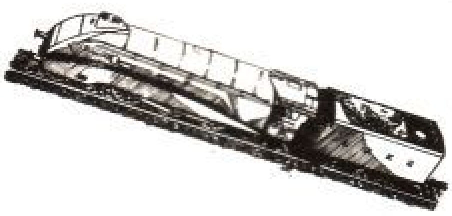
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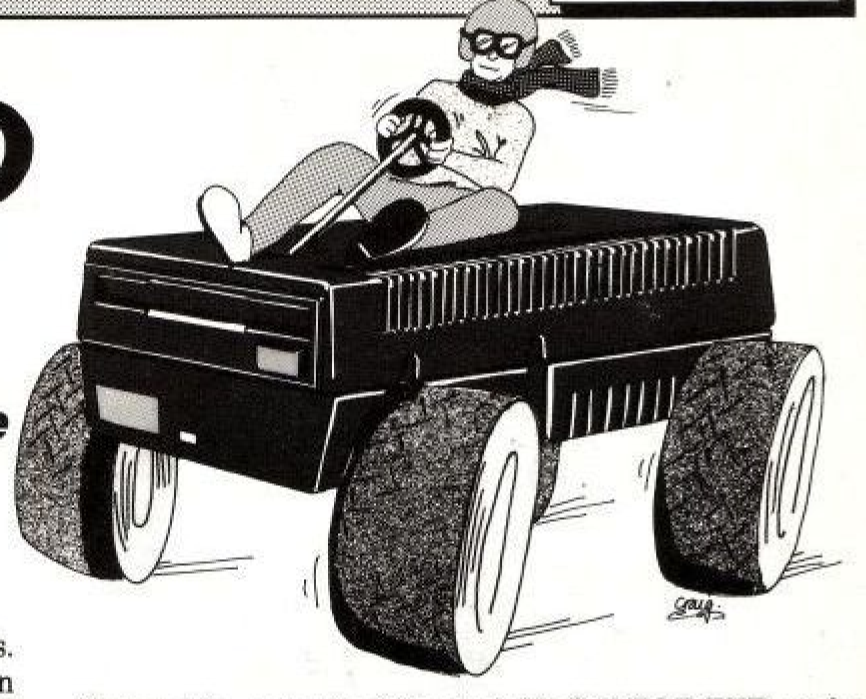
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Toodle PIP

Simon Craven looks at one of the most valuable programs you have on your system disc: PIP

So far we have broken down CP/M into two main parts. Internal commands are those few which live in RAM and can always be used directly from A> prompt. External commands are held on disc, and can only be used when the appropriate disc is in the drive.

When you are using a CP/M system you must unlearn many of the lessons you learnt about the nature of computers from playing with cassette based systems. With a typical home computer, it is natural to think of the 'living' bit of the computer as its RAM. Any programs you want must be loaded into RAM at the start of a session, and then cleared from RAM once they are no longer required. Cassettes, and even disc systems when used as an extension of the 'home computer' way of doing things, are merely back-up devices in which to store things permanently when the RAM is switched off.

With a CP/M machine, however, all the action takes place on the disc. The disc file is the fundamental unit of computer life, and operations are carried out on disc files by other disc files. RAM is just a buffering device to speed up the computer's responses, to store program variables when a program is running and to provide a video display. With home computers, if you want to brag about your system, you casually mention that you have twice as much memory as the next man, but with CP/M machines, it is disc space and speed that counts.

The system discs included with your Amstrad contain many files, some of which are standard CP/M utility programs, and some of which are unique to the Amstrad machines. Few manufacturers of CP/M computers can resist the temptation to mess around with standard CP/M, but fortunately all Amstrad has done is add various bits and pieces such as the SETKEYS.COM utility (CP/M+ only) which lets you redefine the keyboard to taste, and DISCKIT.COM which provides disc formatting and other handy functions. CPC 464 Owners get seperate programs for formatting and copying.

Running a program on the disc (a machine-code file with a .COM suffix, not a Basic program) is accomplished by typing the filename at the prompt and pressing RETURN. The standard way of getting a CP/M utility to actually do something, rather than just sit there, is to give it a command line argument. Using the internal command TYPE as an example:

```
A>TYPE SAMPLE.TXT
```

displays the contents of the text file SAMPLE.TXT on the screen. The name of the file on which the operation is performed is the argument.

A complete CP/M filename is properly known as the file specification, and consists of the drive designation, the filename itself (up to eight characters) and the extender (up to three characters). CP/M+ (Version 3) also has a password facility, letting you add up to eight 'secret' characters which don't show up on the directory and have to be included in any command referring to that file. The syntax for files specifications is as follows:

```
D:FILENAME.EXT or D:FILENAME.EXT;PASSWORD
```

Where D: is the drive on which the file can be found, FILENAME is (suprise!) the filename, .EXT is the extender, and the optional ;PASSWORD applies only to CP/M+ systems.

The A> prompt itself is often criticised as being unhelpful, but frankly, what do you need from a prompt? Users of multi-drive systems will find that typing:

```
B:[return]
```

changes the active ('logged' or 'default') disc drive from A to B, and changes the prompt from A> to B>. Theoretically you can have up to 16 drives, labelled A to P, on a CP/M system, though in real life you are unlikely to encounter more than three or four. On an Amstrad system you will always be limited to two floppy disc drives. Whether a drive is of the floppy disc, hard disc or RAM based variety is immaterial as far as CP/M+ is concerned, but CP/M 2.2 is harder to adapt for use with anything other than floppies. Hard discs are usually drive C, and the RAM disc on the 8256 is designated as drive M.

It is quite simple to carry out operations on files which are not on the logged disc. DIR B: will give you a directory of B without changing the logged disc from A, and referring to a file by its full specification (e.g. TYPE B:SAMPLE.TXT) will force the system to look on a different drive where appropriate.

As an Amstrad owner, the odds are that you have only one disc drive, which can be inconvenient at times. If you are in this position and attempt to access a file on drive B, Amstrad CP/M+ will prompt you to put the appropriate disc into the single drive and press a key. After you do this the prompt will change to B> and for all intents and purposes you will be logged on to a separate disc drive. If you or one of your programs requests access to a file in drive A, the prompt will reappear, and you will have to exchange discs again.

This feature might at first sight seem spectacularly useless, but it does have the virtue of allowing you to copy files from one disc to another quite quickly and easily. When you issue a file-copying command, such as PIP B:=A:SAMPLE.TXT (I'll explain this in a minute), CP/M+ prompts you to swap discs in the drive as necessary. Instead of copying directly from one disc to another, the operating system uses RAM as a temporary buffer to hold the information. If the file you wish to transfer is bigger than the elbow-room available in memory, CP/M+ automatically prompts as many disc swaps as necessary. CP/M 2.2 users will have to use the filecopy program. Messing about in this way is rather tedious, but while you are doing it you can console yourself with the thought that Apple Macintosh owners have to go through exactly the same rigmarole, and pay substantially more for the privilege!

As you will have gathered from the mysterious command used above, PIP.COM is what Real Programmers use to copy files in CP/M. They also use it to join files together, print them out, pull out little sections of files to make new ones, convert text from upper case to lower case or vice versa, make their tea, darn their socks and lots more. PIP may sound like a dumb name for an operating system command, but once upon a time it was grandly entitled the Peripheral Interchange Program, and the acronym stuck. (Digital Research was once called Intergalactic Digital Research -Ed)

Like a number of the more complex CP/M utilities, PIP can be used in two ways. You can give it straight instructions, using a command line argument, as in the case of the file copying command given above, or you can enter it just like an applications program, carrying out many operations before exiting the program and going back to the A> prompt.

As its name suggest, PIP can be used to copy a CP/M file from any CP/M device to any other CP/M device. Making backups of important disc files is the obvious application, but as well as the drives A:, B: and so on, CP/M also recognises the existence of things called LST:, which is usually the parallel printer port), CON:, the console device, which is the keyboard for input and the monitor for output, and AUX:, which is often a serial RS232 interface.

Copying a file from disc to LST prints it out, copying to CON has a similar effect to TYPE, and from CON to LST sends your subsequent keystrokes to the printer. Any permutation can be tried: most will work.

The actual syntax of PIP is rather complex. The basic idea is to type PIP followed by the specification of the new file you want to create, then an equals sign, then the specification of the source of the material to be copied. Thus, to copy a file called OLDFILE.TST to a file called NEWFILE.TST, both on drive A, you would type:

```
PIP a:newfile.tst = a:newfile.tst
```

If A is the logged (default) drive, you could get away with:

```
PIP newfile.tst = oldfile.tst
```

If you are copying a file onto the same disc as its parent, obviously you must give it a different name. When copying to a different drive, you have the option of leaving the name the same. To leave the filename as OLDFILE.TST while copying from drive A to drive B you would type:

```
PIP b: = a:oldfile.tst
```

Connecting CP/M devices together follows the same basic rules - PIP newfile = source -- so to create a disc text file directly from the keyboard type:

```
PIP sample.txt = CON:
```

When you have finished building up your text file with this method, remember to type control-Z (ALT-Z for 8256 owners) which is the end-of-file character and will return you to the A> prompt.

For more intricate operations,

```
PIP bigfile.txt = file1.txt, file2.txt, file3.txt
```

takes the small files on the right of the equation and copies their contents into one large file. Extracting a part of a text file is also simple.

```
PIP midfile.txt = oldfile.txt[groucho:^Z@harpo^Z]
```

extracts from OLDFILE.TXT a portion of text starting with the word 'groucho' and ending with the first occurence of the word 'harpo', putting the result in MIDFILE.TXT.

While copying a file you can change it subtly in various useful ways. PIP has a number of optional trailing parameters, which act as filters, sifting through the file in mid-steam. To use one of these trailing parameters, enclose it in square brackets at the end of the PIP command, for example:

```
PIP sample.txt = linenos.txt[N]
```

creates a copy of SAMPLE.TXT, adding line numbers to the end of each line. Since the trailing parameter options are one of the few subjects adequately explained in the manual you get with your Amstrad, there is little point listing them all here.

The versatility of PIP.COM is one of the best things about CP/M: indeed, it makes allegedly more advanced operating systems (particularly MS-DOS and PC-DOS) look very weak. Have a play with it and have fun. ACU

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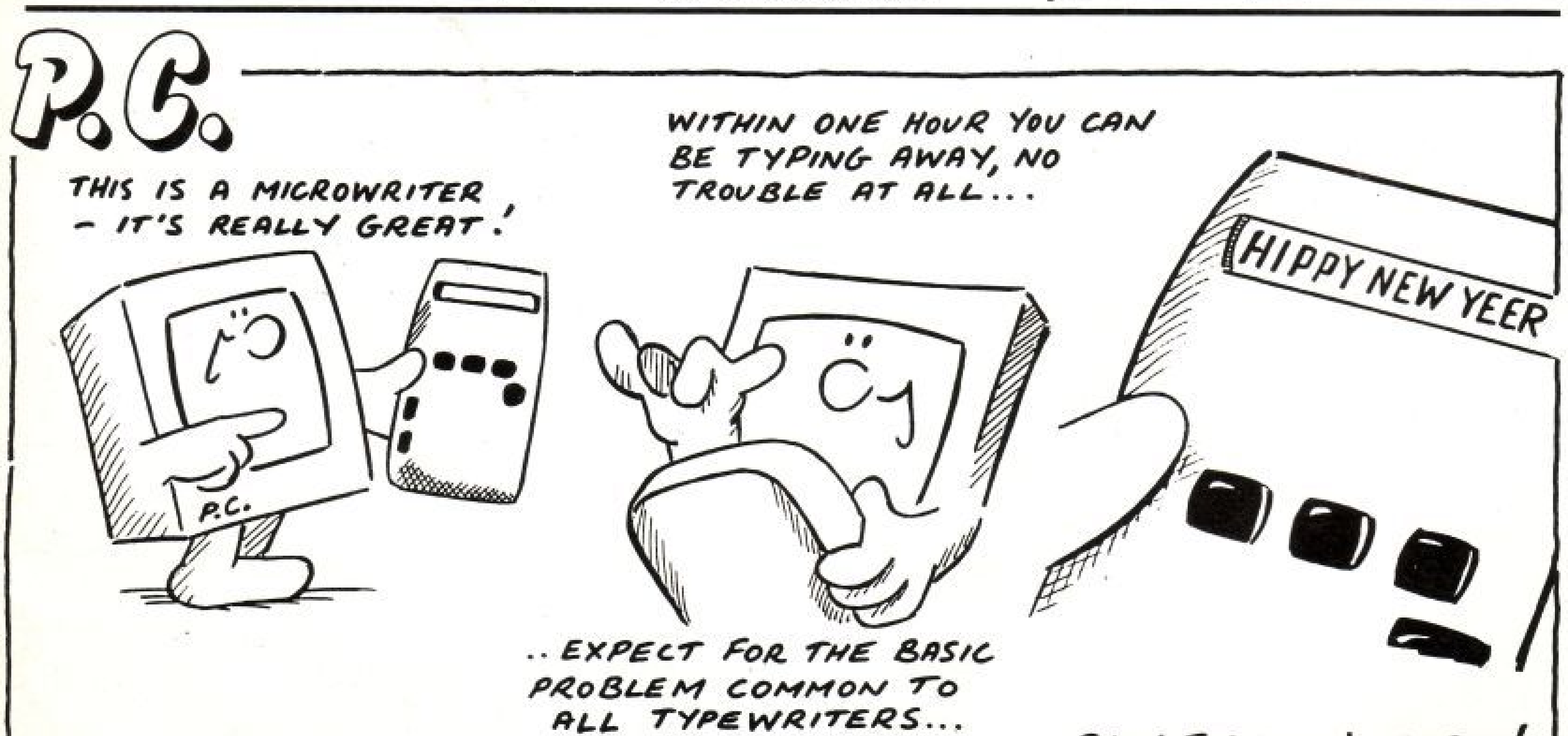
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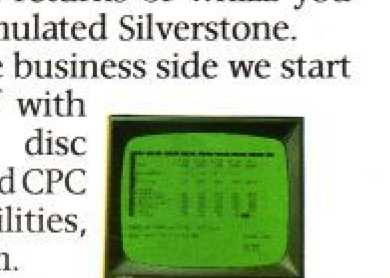
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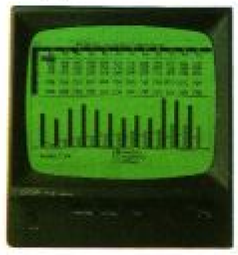
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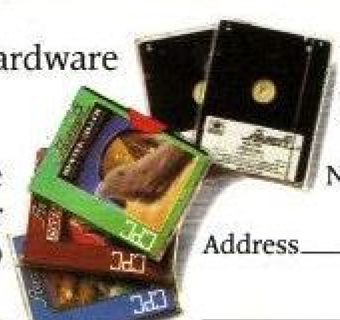
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Amstrad CPC 6128 with 128k memory

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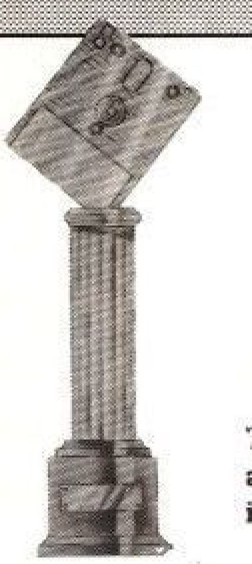
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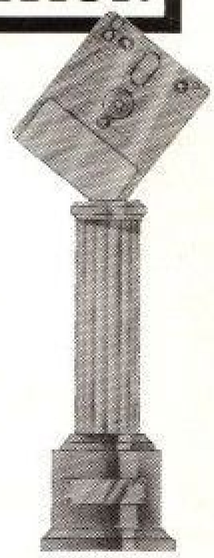
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Amstrad User Awards



'Lets have some awards' said the Editor, 'then all the readers can vote for their favourite computer thingies and we can award prizes'. So that is what happened, a list of categories has been drawn up, all you have to do is vote. If you really need to be convinced this should do it... FREE SOFTWARE. The first hundred votes drawn out of the Editors' bowler on January 10th will get a copy of Silversofts' latest release 'Bored of the Rings'.

About 'Bored of the Rings'

If you have read the J.R.R. Tolkien book 'Lord of The Rings' you will feel a strong sense of deja vu, 'Bored' is a spoof, you have to guide Fordo and other friendly anagrams through the adventure to prevent a magic ring from falling into the hands of an evil force. When the game was first released for the Speccy it was so successful that Delta 4, who wrote the game, could not handle the success. They turned to Silversoft, who helped them turn one of the funniest adventure games into one of the best selling 'Bored of the Rings' is only just out, if you can't wait to win a copy it will cost you £6.95, has over 200 locations, many of them with graphics.

The Awards

A prize of a 'Roland' and a certificate will be presented to winning software houses, although we may chicken out when it comes to the people with the worst software. You may photocopy the page but please only enter once for each copy of the magazine you buy. Any software house caught buying hundreds of copies of Amstrad User to send in forms will greatly please the local shopkeeper.

The Categories

1	The 'Your name in lights' award for PROGRAM OF THE YEAR	
2	The 'I wore out three joysticks' award for GAME OF THE YEAR	
3	The 'I couldn't live without it' award for UTILITY OF THE YEAR	
4	The 'It plugs in the back and does wonderful things' award for PERIPHERAL OF THE YEAR	
5	The 'It even knew how to add' award for BUSINESS PROGRAM OF THE YEAR	
6	The 'everybyte they code is magic' award for SOFTWARE HOUSE OF THE YEAR	
7	The 'Not worth the price of a blank tape' award for WORST GAME OF THE YEAR	
8	The 'I'll take three please' award for BARGAIN OF THE YEAR	
9	The 'Six trillion aliens later' award for SHOOT-EM-UP GAME OF THE YEAR	
10	The 'Now if I get the crown then...' award for ARCADE STRATEGY GAME OF THE YEAR	
11	The 'I'll go to bed soon mum' award for ADVENTURE OF THE YEAR	
12	The 'He even stocks DMP-1 printer ribbons' award for SHOP OF THE YEAR	
13	The 'Mum I want this...' award for ADVERTISEMENT OF THE YEAR	
14	The 'Dig that beat' award for BEST MUSIC OF THE YEAR	
15	The 'Nice screens, shame 'bout the game' award for BEST GRAPHICS OF THE YEAR	
16	The 'Now that I haven't seen before' award for ORIGINAL PROGRAM OF THE YEAR	
17	The 'Plots a bit thin' award for BOOK OF THE YEAR	

pride utilities

Some programs are sold on the understanding that they must not be used to infringe copyright.

TRANSMAT

EASY TAPE TO DISC TRANSFER

This professionally used and respected utility has set the standard in tape to disc transfer that others attempt to mimmick. What the press think of Transmat:

- ★ Voted No. 5 in the Serious Programs Top Ten Chart by Amstrad Action Readers. Nov. 85
- ★ Maximum review ratings in PCW Aug 85
- ★ Highly recommended by AMSCLUB
- ★ "Very easy to use utility" *PCT July 85*. Also selected for Best of the Bunch

Transmats many features include:

- ★ Easy operation ★ Auto or non auto modes
- ★ Relocator for programs which overwrite the disc area
- ★ Erase ★ Catalog files ★ Rename
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SYSTEM X

The software utility that offers a massive 30 plus extra basic commands for your AMSTRAD. (Our product is so good that our competitors even try to copy the program name!)

If you are a serious programmer requiring the flexibility and time saving afforded by System X, or a beginner requiring an obvious advantage and fun with the versatile graphics commands — then SYSTEM X is a must for your software collection. Due to the compact nature of the machine code the program will take only 3k bytes of RAM still leaving a generous amount of program area. The program is suitable for all CPC models and is available on ROM as well as on disc or cassette.

A BRIEF SUMMARY OF NEW COMMANDS

```
|CAPOFF    Turn off caps shift within program
|CAPON     Turn on caps shift within program
|CIRCLE    Draw circle or oval
|CUROFF    Turn off text cursor
|CURON     Turn on text cursor
|DEPRO     Deprotect a BASIC program
|DPEEK     Two byte peek
|DPOKE     Two byte poke
|DSCREEN   Move whole screen down one line
|FILL      Fill any area with a colour
|FLUSH     Clear input buffer
|FRAME     Wait for frame flyback pulse
|GETCHAR   Get a character from the screen
|GETKEY    Get a character from the keyboard
|GPEN      Set the graphic pen to an ink
|GOVER     Turn on the graphics XOR function
|HELP      List the SYSTEM X commands
|INVIS     Make the screen invisible
|INVERSE   Swop pen and paper
|LSCREEN   Move whole screen left
|MOTOR     Turn cassette relay on/off
|PRON      Echo screen printing to printer
|PROFF     Turn off echo to printer
|PROTEC    Protect a BASIC program
|RPEEK     Peek into a ROM
|R         Reset pens, inks, border and mode to default
|RESET     Reset pens, inks, border and mode to default
|RSCREEN   Move whole screen right
|SHIFT     Shift a block of memory
|USCREEN   Move whole screen up one line
|VIS       Make screen visible after |INVIS
|ZIP       1000-4000 baud, cassette saving speeds
```

Instructions include more detail plus examples for you to type in.

Price: £9.95 on tape, £13.45 on disc, or "ROM" for only £19.95 inc.

SYSTEM X voted into the Serious Programs Top Ten by Amstrad Action Oct. '85

SYSTEM X "Very impressive". *Home Computing Weekly 24th Sept.*

AMSTRAD

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Scriptor is a two program pack offering full 80 columns of text with 66 lines per page. A superior, easy to use utility at a realistic price.

Suitable for all CPC Models — Cassette £6.95 inc. Disc £10.45 inc.

Included in "Best of the Bunch" *(PCT July 85)*. "It has made the DMP-1 into a far better printer".

RSX PRINTER PAC-1

PRINTER UTILITY FOR DMP-1 AND EPSON COMPATIBLE PRINTERS

A resident system extension which adds SIX new commands to any CPC model. A two program pack which caters for the **AMSTRAD DMP-1 printer** (AMDUMP) and **EPSON compatible printers** (EPDUMP). Screen dump in all modes. Two sizes with EPDUMP. Text dump in all modes. Specify background inks. Abbreviated codes to printer. Three new type styles for the DMP-1. Can be used with AMSWORD. Included in Best of the Bunch — *PCT July '85. "A very useful utility, frequently used".*

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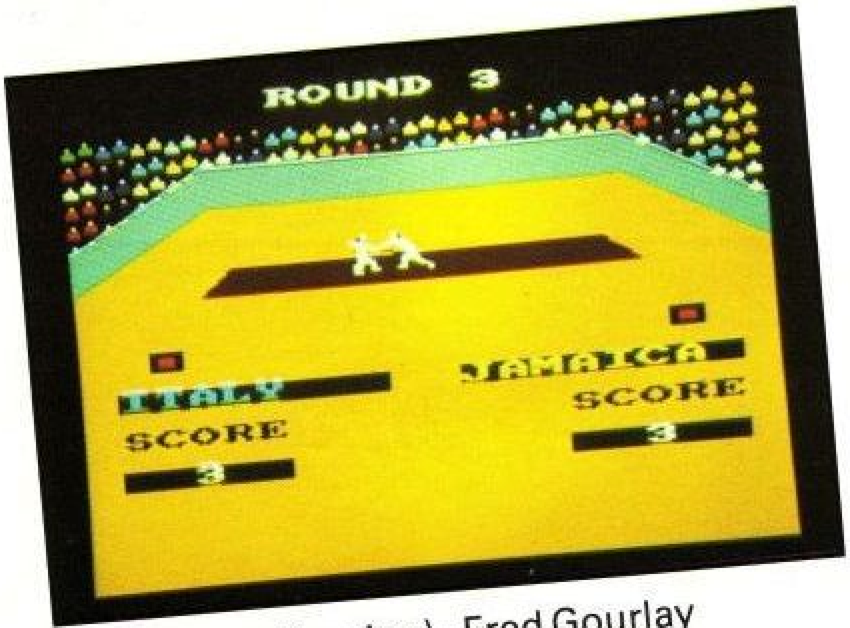
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BARCLAYCARD VISA

Amsoft's £2000 Software Competition

This months software competition contained another batch of good quality entries. It was a difficult choice to decide between some very good games or some useful utility software. In the end we have decided to award four programmers £500 each. Just remember, if you are a User Club Member send us the brilliant program you have just written and you could be next months winner.



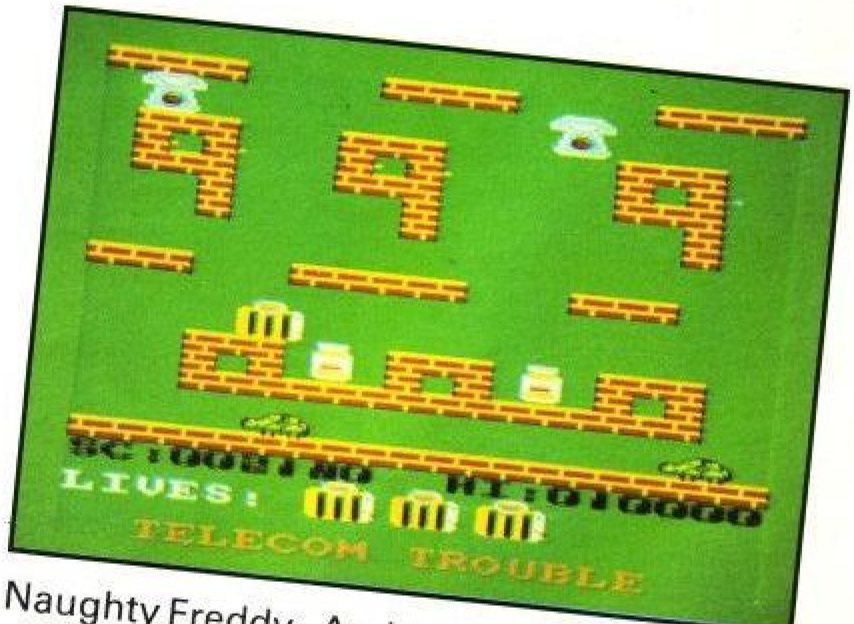
The Games (fencing) - Fred Gourlay

The Games, Fred Gourlays entry, from Irvine in Ayrshire, is a little like Daley Thompsons Decathalon. It has ten Olympic events including swimming, fencing, sprinting, the long and triple jump, pole vault, discus and hammer. You can play for any one of the 8 teams involved or enter your own team. Events are organised in true style with field events like the long jump taking three turns and competitors having three attempts to qualify at a particular height in the polevault. To aid a competitor in his attempt, the Z and X keys are pressed in turn and if necessary copy is pressed to jump, throw or whatever. In the fencing event copy is used to thrust at your opponent. There is also a demonstration facility that allows you to see a particular event rather than play through them all. We were impressed by the graphics which look very good but were disappointed by the animation which is limited to a small number of frames giving a jerky effect. Also when playing the game there was little to do but watch while the other teams were having their turn. Very realistic! Each event takes place in a well populated arena and the crowd can be heard to applaud when an event is completed. A nice touch is the official who waves his flag when a competitor fails to qualify in some way. Fred must have put in quite a bit of effort to produce all ten events and this was a major consideration when we awarded the prize.



The Games (pole vault) - Fred Gourlay

Naughty Freddy is the title of our second prize-winning entry. This was sent in by Andrew Green of Andover in Hants. This is a very colourful sprite game, where Buzz-Bee the Bee has to gather up the jars of honey which naughty Freddy the Teddy (who doesn't make an appearance in the game) has hidden. He must avoid the unpleasant hazards that move constantly across the screen while doing this. Lucky the game has good keyboard response, you need it when trying to avoid the moving walls and other objects. All in all, Naughty Freddy is a pretty good looking game with several screens to complete. The sprites move smoothly but are a bit flickery. Although the game does not use a particularly original idea it is well implemented and worthy of a prize.



Naughty Freddy - Andrew Green

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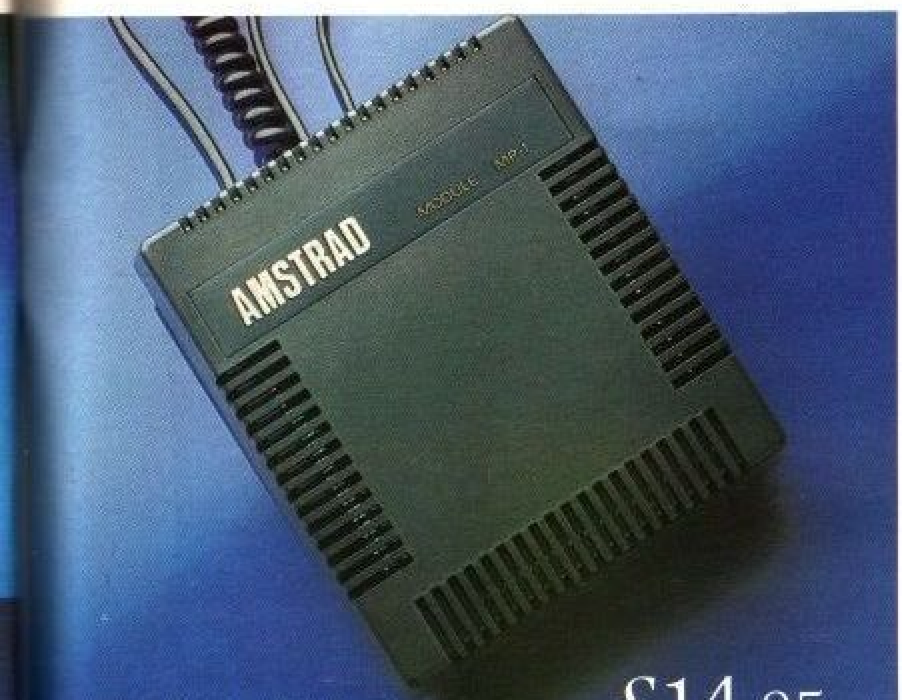




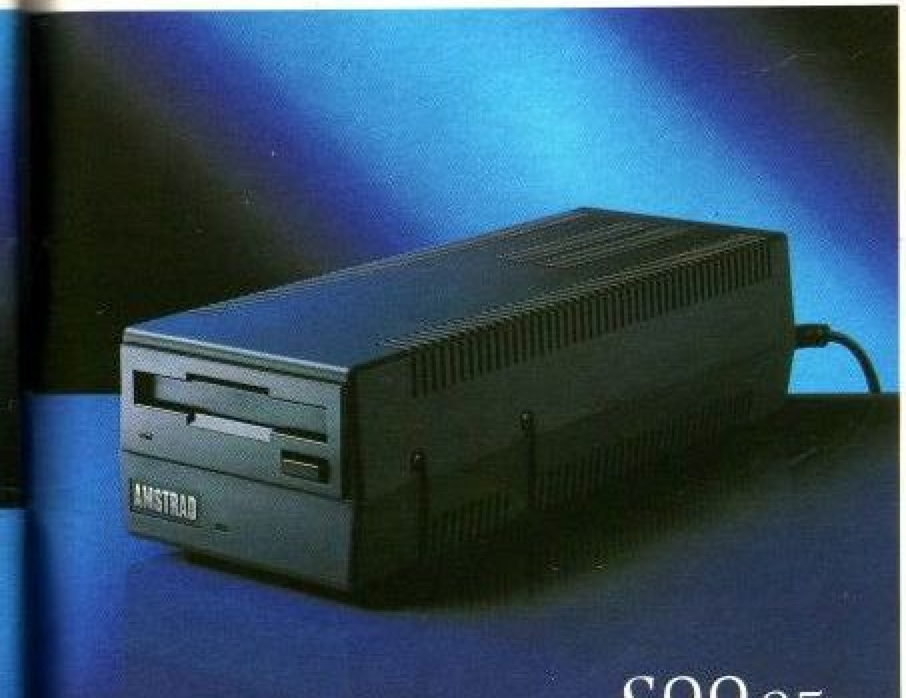


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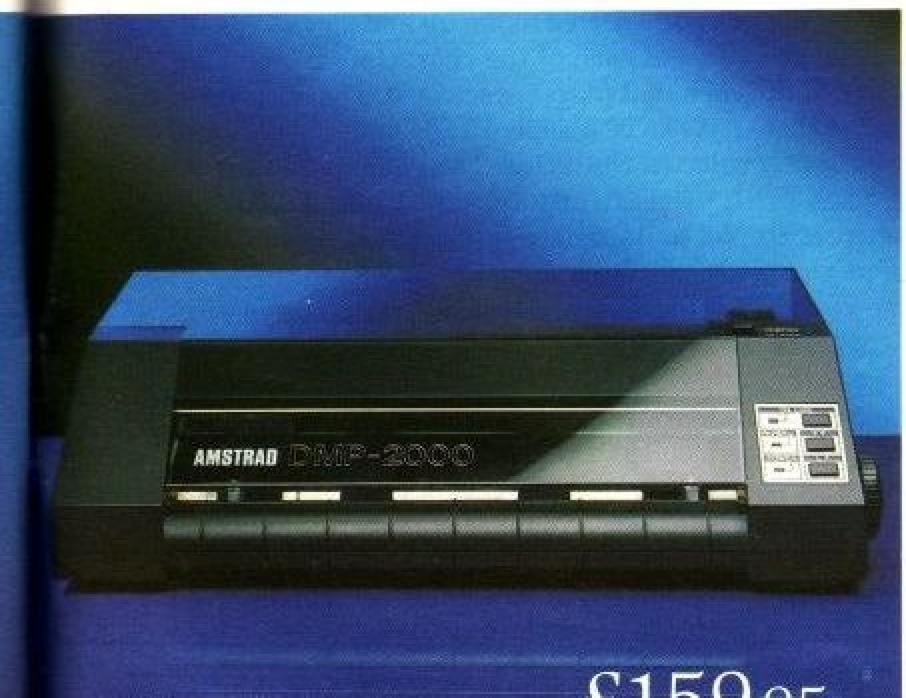
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The CPC 464 comes with built-in datacorder, and the CPC 6128 with built-in disc drive. And both have either a full colour monitor or a green screen.

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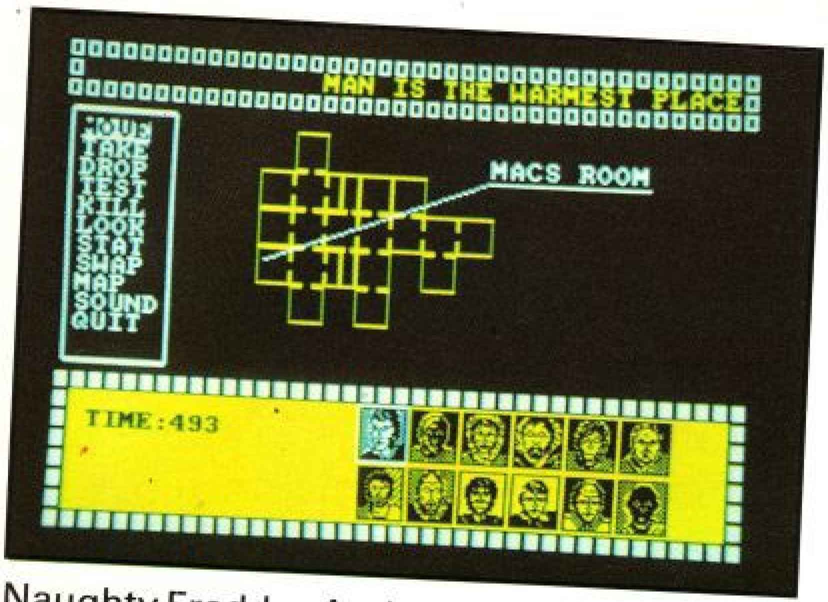
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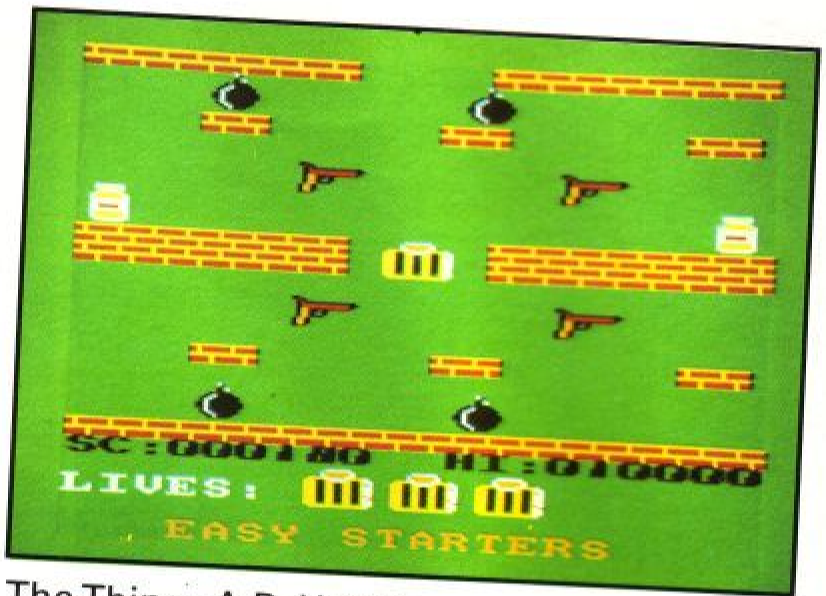
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Naughty Freddy - Andrew Green



The Thing - A.D. Halliday

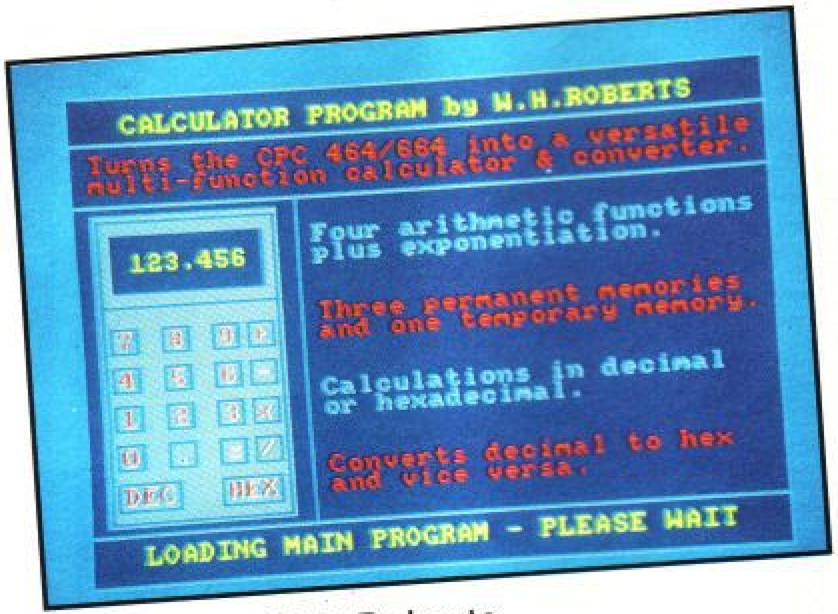
Super Sprites is an excellent utility providing both a sprite editor and RSX's to use sprites from Basic and machine code. This entry was from Roy Poole who comes from Liverpool. The sprite editor makes it possible to build up a sprite with individual pixels set to a specific colour rather than just one colour.

Amongst other things his program includes a number of commands to create interesting screen effects such as split screens. The sprite routines include collision detection and the ability to animate frames making it a very comprehensive package. Our major criticism of his program was with the sprite editor which seemed a little unfriendly in some respects. Also his demonstration did not do justice to his sprite software. This is something that all entrants should bear in mind. If you have a good piece of utility software a good demonstration will strongly influence the judges. However, I am sure that Roy will go on to produce some excellent software using his sprites and we will be delighted to see it when he does.



Super Sprites - Roy Poole

Our last prize-winner is A D Haliday of Widnes, Cheshire. A D sent us The Thing, a gripping strategy adventure game, based on the film of the same name. The Thing is a story along the same lines as Alien, where a group of isolated people are menaced by an alien being. The action takes place at an Antarctic base where you control any of the base personnel as you try to discover the identity of the intruder and eliminate the thing. The tricky bit is discovering the intruder before he eats you. The Thing can take on the appearance of anybody it comes in contact with, making it a bit difficult to spot. On the screen the game displays a menu of options which can be selected using up and down keys. It also displays pictures of each of the characters in the film which are lit up when that player is selected. There is also a plan of the base that can be displayed, showing the position of the currently selected character. The game is similar in many ways to the Amsoft/Argus Press game Alien and manages to create some of the atmosphere that Alien produced. Our criticism of this game would be of the slightly strange keyboard input as this detracts from an otherwise excellent game.



Calculator - W.H. Roberts

Amongst the other entries for the competition were Amsrace and Stockmart from Phil Tayler of Holland on Sea, Essex. Amsrace is a collect things in the maze against the clock type game which is exceptionally difficult. Stockmart is a share trading game for a number of players where the object is to accumulate capital.

Calculator from W H Roberts of Pencoed, Mid Glamorgan is a program to turn a 464 into a calculator complete with a hex to decimal mode and memories.

ACU

£2,000 program competition!

Think what you could buy with a £2,000 windfall...

The objective couldn't be simpler: write the best program submitted to the AMSTRAD USER review panel. Every other month £2,000 will be shared amongst the very best entries.

RULES

1 The winner(s) will be the entrant or entrants who submit the best program. It may be any piece of software that runs on the CPC464 or CPC6128

2 The name of all the winners will be printed in the next available issue of Amstrad User.

3 All entries must arrive by Febuary 1st 1986. Entries arriving after that date will be included in the next issue's competition.

4 All entries must INCLUDE a disc or cassette copy of the program with some codes where application (plus loading instructions where necessary!), AND A SIGNED COMPETITION ENTRY FORM.

A full listing would be helpful, but not essential. A brief summary of the program and its purpose should accompany all entries.

5 All entries will be treated in strict confidence

6 Neither AMSOFT nor AMSTRAD can be held to be responsible for any loss or damage to any submission.

7 No correspondence can be entered into concerning programs submitted for the cash prize competition.

8 The decision of the judges is final.

9 It is a condition of entry that all entrants have exclusive ownership of the copyright of the material submitted, and that the winners agree to assign all copyright in the winning program to Amstrad.

All entrants must undertake not to submit the same or a similar program to any other magazine, publisher or organisation until after the announcement of the winning entry.

10 Amsoft may offer to publish programs either in Amstrad User or as commercial software, in which case Amsoft will agree the terms on an individual basis with the author(s) concerned. Amsoft reserves the right to amend, alter or revise any program that is publishes.

11 No employees of Amsoft or Amstrad, or their relatives may enter this competition.

12 All entries must have the name and address of the programmer as REM's in the first few lines of the program or loader.

HOW TO ENTER:

Think about your program, and map it out in a series of events or features. Write the program onto cassette, based around these events and check that the program runs as intended. Once you are satisfied, send a copy of the cassette in a suitable envelope along with the following:

1) A brief summary of the program in 500 words or less.

2) The completed competition entry form, which must be signed.

3) Program listings, if available.

4) SAE if you want your entry returned.

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No entry is valid unless accompanied by this official entry form.
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***NB All programs must be submitted in UNprotected form. Preferably on disc.**
I have read the rules published in AMSTRAD COMPUTER USER, and agree to be bound by them.

I have enclosed:

- ☐ **tape/disc**
- ☐ **listing**
- ☐ **SAE for the return of my entry**
- ☐ **A summary of up to 500 words**

I am over 18 years of age. YES/NO: Age if under 18 ....

(The signature of a parent or guardian is required where the entrant or the nominated representative of the entrants is under 18 years of age.)

SIGNATURE .... **Date** ....
Program Name ....

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SUPERPOWER WORD PROCESSOR (Ref A106)

This program incorporates the most useful facilities offered by the best Word Processors currently available on the BBC Micro and other up-market Home Computers.

Text Entry/Editing. User choice of 40 or 80 column mode. Document formatting achieved through use of embedded commands. Text can be formatted and justified on screen, if required. Find <and Replace>with 'wild-card' option. Word count, character count and page numbering reported.

Formatting. Multiple rulers are provided, allowing sophisticated layout of documents e.g. different combinations of TAB stops at different points in the text. All the normal controls are available e.g. page lengths & width, margins, indents, tab stops, justification, headers, footers etc., together with output of control characters to the printer.

Virtually UNLIMITED Document Length. The disk routines in the program handle multiple data files representing parts of a total document, with loading and saving carried out automatically.

Simple Calculator. A calculator window can be called to carry out simple arithmetic calculations. It is also possible to embed a calculation in the text, with the result being calculated and printed on output.

Data Exchange. As part of an integrated suite, the program will be able to handle ASCII files originating from the Spreadsheet, Database and Graphics/Statistics Packages.

Disk/External Commands. Direct Access available.

MANY MORE FEATURES. Ask your dealer for information.

SUPERPOWER DATABASE (Ref A107)

This menu-driven program has been designed to be the most comprehensive and flexible Database which can be achieved in 16K of machine code. Of special note are the PROCEDURES which have been implemented, enabling the more advanced user to write simple structured programs to manipulate the database information in order to meet his more specialized requirements. Databases need not be limited in size since the program contains routines for multiple file handling.

Field types — alphanumeric, integer, currency, floating point, logic, calculated and date.

MAIN FILE COMMANDS
— Create/Modify database structures, reports and procedures.
— Create ASCII file from a Database, enabling data to be passed to the Word Processor, Spreadsheet and Graphic/Statistics programs.
— Copy data to new Database.

RECORD EDITING
— Add, amend, delete, insert, view and duplicate.
— Search and Sort. Due to intelligent file structure and the indexing system adopted, both SEARCH and SORT are extremely fast.

REPORTS
Standard — selected fields may be output, together with totalling on those nominated. (Value fields only). Screen or printer output.
Labels — user-selected fields for printing. User-defined label size, number on sheet etc.
User-defined — user created report-format, combining entered text and designated fields. Editing and storing facilities.

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An Unnatural Phenomena

This is indeed a strange business. The adulation of the media has not yet gone to Alan Sugar's head, and he has resisted the urge to go and splash out on corporate ego trips such as sponsered racing cars, company aeroplanes and appearances as a telepundit. Thus he may retain his sanity whilst all around him are losing theirs.

Curiously however, amidst all this media attention for Amstrad and its products, the specialist computer stores steadfastly place their telescopes to their blind eyes and 'see no ships' in the shape of the Armada of Amstrad owners who are calling the bluff of the £3000+ alternatives to the £399 PCW8256, although a trip around the UK's premiere computer show, Compec, revealed more gloom than anyone could remember for a long time past.

Are we facing the unlikely spectacle of the IBM clone market actually passing the price of the Amstrad PCW8256 on its way down? And even if it did, would anyone want one? It's as well to remember that Amstrad has been in the market 18 months with scarcely any price erosion for the simple reason that the product has been universally recognised as being thoroughly good value for money, and clearly better than the competition offerings.

A lemon is a lemon, whether or not it costs £399 or £79.

Ask Amstrad

As computer owners and readers of this magazine, you probably get asked quite frequently by friends and family what computer they should buy. Imagine your frustration when they insist their budget won't stretch to an Amstrad computer - but they've "seen the Dixon's advert for Acorn Electrons, and they look such good value...."

You've heard it, eh? Well, my advice is simple, point out that a discontinued car without an engine, gearbox and wheels is also cheaper than one properly equipped.

Which Computer?

See you there at the NEC show arena in January. If you enjoy a good windup and have nothing better to do, ask all the dealers selling PCs for £3000 what their product can offer the average user that the PCW8256 can't. Have you ever seen grown men cry?

'Allo John got a new job?

As well as saying goodbye to William Poel (see News), this month we say goodbye to John Alexander our very own Picasso. John has been with Amsoft since before the launch of the CPC464 and has been responsible for the design and illustration of the magazine from the very start. Also he has produced many of our leaflets and brochures for the various computers and peripherals and many listings and articles have been illustrated by his distinctive 'Alex' drawings over the months.

John is leaving to start a new business with a group of his friends. He has a passion for customising motorcyles (no you can't have one with a keyboard) and the new company will specialise in selling parts and accessories for the gleaming beasties that people enjoy backing lorries into. The company will also be able to do customising work to order and this will include chromium plating any little bits and pieces. So if you want the laser beams to bounce off your missiles you better zoom down to Chelmsford and find the Motorpsychosis shop.

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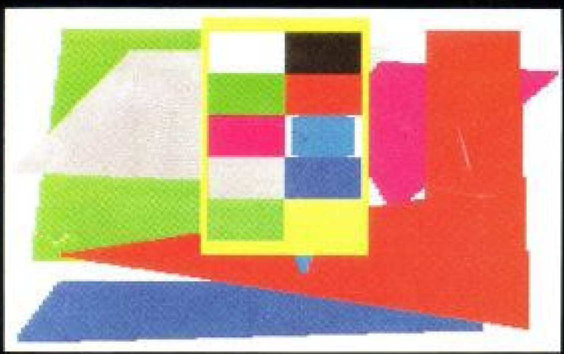
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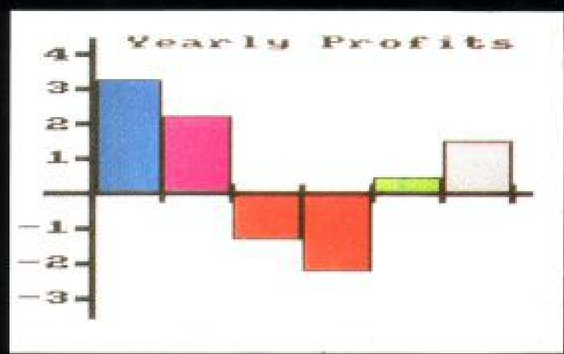




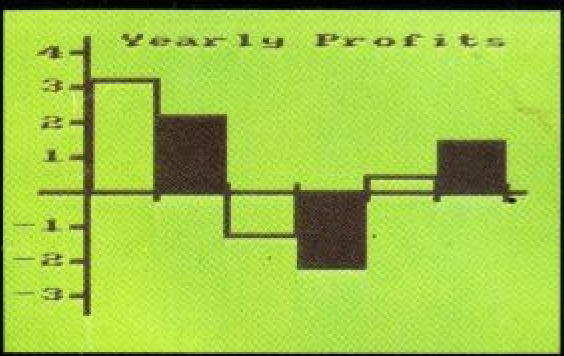
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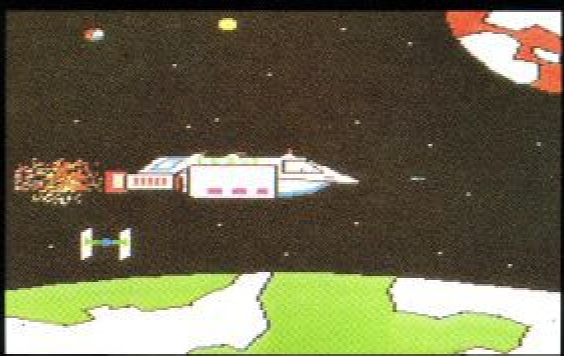
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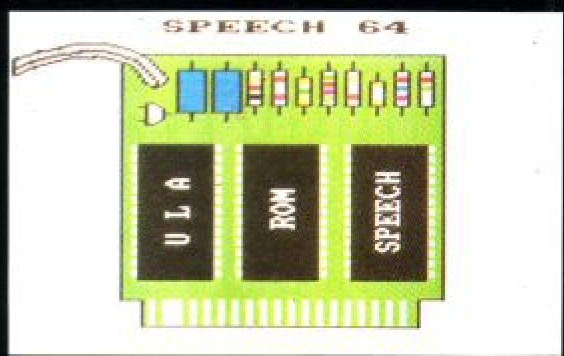
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